


INDOOR GARDENING

VISHNU SWARUP



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Director (R&D)

Indo-American Hybrid Seeds
Research and Development
New Delhi



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PREFACE TO THE SECOND EDITION

SINCE the first edition of the book, many new species and varieties of indoor plants have been introduced by the plant nurseries. These new additions have been included in the second edition. The information on other varieties has been updated in many cases. A brief description of the tissue culture technique being used commercially nowadays for propagation of indoor plants is also included

New Delhi
18th October, 1990.

VISHNU SWARUP

PREFACE TO THE FIRST EDITION

FOR all those who love plants but do not have open spaces for gardening, an effort has been made in this book to give information on the growing and display of the house plants which have nowadays become an essential part of interior decoration. The pleasures and thrill of growing house plants are immense, for indoor gardening brings about an intimate and natural association of the man and the plant.

In growing plants indoors, sometimes there are disappointments, particularly in the beginning. Keeping this in view, some practical suggestions have been made for successfully growing house plants. Of the numerous species of house plants available, only about a hundred have been described in this book. Many may find them useful and easy to grow under our conditions. To facilitate the choice of house plants a list of suitable plants for growing in different aspects inside the room and for special purposes is presented at the end.

I gratefully acknowledge the assistance of Shri R. Rajendran, Division of Horticulture, Indian Agricultural Research Institute, New Delhi, in taking the photographs, and Shri V.P. Agnihotri, an enthusiastic gardener, for permitting me to use some of his plants for photographing. I should also like to acknowledge my deep gratitude to Dr. B.P. Pal, Director-General, Indian Council of Agricultural Research, New Delhi, for his keen interest and constant encouragement in this work.

New Delhi

VISHNU SWARUP

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CHAPTER 1

INTRODUCTION

INDOOR gardening, which is never out of season, is a joy to many, particularly those living in cities where they do not have open spaces for gardens. A single potted plant is in itself a whole garden. Indoor gardening is richly rewarding and a good pastime not only for old who are in poor health but also for those who are hale and hearty. In recent years, house-plants which can thrive in homes have become increasingly popular for interior decoration. They add charm to the architectural beauty of the house and complement the interior setting.

In the early days, Greeks and Romans grew a few plants indoors. House-plants became popular after the Second World War. The Scandinavians and the Americans are the pioneers in indoor gardening. In Europe and America, with the advent of better living conditions like central heating and air-conditioning, modern architectural designing with larger windows and frequent use of glass panels and built-in 'planters' or troughs, the growing of plants indoors has been facilitated in recent years. With these facilities, it is now possible to grow a variety of plants inside the rooms instead of a limited choice available earlier. In India, modern architectural designing of homes and flats, having larger windows and well-lighted rooms, has made indoor gardening a popular, useful and absorbing hobby, particularly in big cities. It is now common to find living plants inside homes, offices, shops, banks, hotels, restaurants, clubs, hospitals and schools.

CHAPTER 2

THE PLACE OF HOUSE-PLANTS

HOUSE-PLANTS can be placed either in suitable groups as bold accents or singly as a spotlight depending upon the size, colour and style of rooms. An impressive group of bold-leaved large plants set against a big wall will be more appropriate to scale than a small single plant. In a smaller room, single plant specimens appear more attractive and in better proportion to their setting. A tall plant like *Philodendron* or the Rubber Plant may look graceful in a room in which horizontal lines predominate, as the vertical line of the former will be a pleasing natural contrast to the latter. The architectural setting as well as furnishings of the room should also be taken into consideration. A tall *Monstera deliciosa* plant having broad, large cut-leaves or large ferns with delicate lace-like foliage when placed in a room of contemporary style set in with simple straight lines will appear striking, whereas *Ficus elastica*, *Dracaena* or *Dieffenbachia* with foliage having sharp lines may be a pleasant contrast in a traditional room with ornamental furniture and settings. In an office, tall broad-leaved and tough plants like *Philodendron*, *Sansevieria*, *Dieffenbachia*, *Dracaena* and the Rubber Plant can be more impressive and harmonious with the surroundings than delicate-leaved ferns or bright-coloured flowering plants which are more suited to an interior decor in the home. Similarly, plants with red, pink or orange flowers like *Amaryllis* or *Chrysanthemum*, or those having bright-coloured foliage like *Coleus* and *Caladium* should be placed against the white, light-coloured or neutral wall; against a dark background white-flowered plants or those having variegated or white foliage like *Caladium* may enliven the surroundings. Plants having delicate and finely-cut foliage like ferns or with small flowers such as *Begonia cuculiata* syn. *B. semperflorens* are generally placed at a closer distance and others are set against the bold and rough-textured plants so that these could be seen to the best advantage and admired at close range. The large, broad-leaved *Philodendron* or the Rubber Plant can be an attractive foil to the ferns having delicate lace-like foliage. While grouping plants, their height should also be taken into consideration. Tall plants are best placed at the back, medium-tall plants in the centre and dwarf or trailing ones in the front. However, if the group is to be placed in the centre of a hall or room where it may be viewed from all sides, the tall plants should be kept in the centre with medium-tall ones arranged around them and the dwarf ones along the edge. Sometimes potted plants of *Chrysanthemum* or *Aster* in bloom and *Coleus* and *Caladium* can be grouped inside the room by bringing them from outside to produce a quick and effective display. However, such arrangements are temporary and require

replacement when the plants have completed their blooms or passed their best stage. Flowering plants look very impressive in association with foliage plants. Both harmonious and contrasting combinations of plants can be planned keeping in view their texture, size, colour and pattern of foliage and flowers. With several attractive and widely divergent forms of house-plants that are available now, the choices of grouping them in suitable and glamorous combinations with personal ingenuity are many.

Sometimes the plants are grouped and grown in terrarium (glass cases), bottle, bowl, dish, trough and aquarium cases as elegant table decorations. Suitable combinations of plants can also be used effectively to create delightful miniature landscapes of woodland, rock, desert or formal garden scenes for indoor decoration.

Potted plants can be displayed on the floor, window-sill, window-ledge, table, desk, book-case, shelves and trolleys, or in window-boxes, planters—both on stand and built-in on floor or at floor level (sunken beds)—wall-brackets or plant stands placed on the floor. There may be individual plant stands and wall-brackets or those accommodating 2 or more potted plants. The pots must stand in platters or shallow trays so that water does not drip and spoil the furniture, floor or rug. The planters should have proper drainage and the pots may stand on pebbles in built-in planters or on wood blocks inside the planter. For easy movement the planters or large tubs with castors are preferred. Sometimes the pot may be kept inside a metal or reed basket for an attractive display. The colour, size and texture of the containers in which the plants are grown should harmonize with those of the plants and the setting of the room.

In modern architecture, built-in planters or sunken beds have become increasingly popular; they sometimes serve as useful space dividers in a large room. The living- and dining-room spaces can be divided with beautiful planters having gorgeous foliage and flowering plants. The trailing plants like *Scindapsus*, *Philodendron*, *Ficus pumila* and a few others can be trained on trellis or screens which may be used as natural space or room dividers. Several plants like *Aglaonema*, *Sansevieria*, *Aspidistra*, *Philodendron*, *Zebrina pendula*, *Scindapsus* and *Tradescantia fluminensis* which require comparatively less sunshine are useful for this purpose. There is unlimited scope for house-plants used effectively for interior decoration.

Window garden. The most common place to keep house-plants in a room is the window-sill, window-ledge or window-box. The windows are the best show-cases for indoor gardens. A window garden is the most satisfactory place as the plants are usually set-in in the show-case of the windows where the light makes their colours glow and helps in the growth of the plants. The plants can be placed on the window-sill and shelves or on plant stands, tiered tables or plant trolley and planters. Sometimes the window garden may be a part of the architecture having built-in planters for keeping plants. These permanent planters should have proper drainage. The plants can also be kept in water-tight trays placed in the window-ledge. While placing plants in a window, due

care must be taken to choose the right type of plants. The plants requiring plenty of sunshine should be placed on the south side as well as on east and west sides, while the shade-loving plants can be placed on windows facing north and those needing medium light may be grown successfully on east and west sides. The climbing plants can be used effectively for framing the window when grown on the sides or for drooping effects in the front edge of the planter, trough or window-box.

Colourful window-boxes. Many modern homes and flats have built-in window-boxes in which flowering and foliage plants can be grown. These boxes are permanent rectangular structures constructed as projections outside the windows. With suitable plants they provide a splash of colour to be enjoyed from inside as well as from outside the window, and often enliven the drab and bare walls and surroundings.

Window-boxes can also be made of wood and fixed outside the window; a convenient size would be 41-45 cm wide at the top, 30 cm at the bottom and 20-25 cm deep. The length will depend upon the size of the window. It should not be more than 0.9 to 1.2 m in length. It is better to have more than one box if a larger area is to be covered. The boxes must be painted from inside with water-proof paint and preferably white on the outside. Drainage holes at the bottom, which are suitably covered with crocks, should be made before filling in the soil mixture. A good soil mixture for window-boxes consists of 3 parts of garden soil and 1 part each of cow-dung manure and leaf-mould with a little sand depending upon the type of the soil used.

The common practice is to sow seeds or transplant seedlings or plants directly in the box at an appropriate time. Another practice is to place potted plants inside the box. This is better as the plants can be placed or removed according to the need. In such an arrangement the plants which are not found to thrive, or have completed flowering, or have become old and lanky can be replaced with some other suitable subjects easily. In this way it is always possible to have a colourful display of flowers and foliage and to alter the plant arrangements frequently to break the monotony of any particular type of display. The boxes should have proper depth so that the pots placed inside are not visible from outside. This method also helps to overcome the difficult task of changing the soil in the box when it becomes sick. Plants, particularly the flowering ones, should be grown in pots outside and placed inside the box only when they are in bloom or have attained sufficient size. The potted plants in flower can be got from a local nursery if these cannot be raised in the house. In a box of about 46 cm width one can accommodate at least two rows of pots, one of larger (20 cm or 25 cm) and the other of smaller size (15 cm). Tall and medium-tall plants can be placed in larger pots in the back row, whereas the dwarf or trailing types may be kept in the front row with the trailing plants gracefully hanging down the front edge.

Of the perennial or annual plants or a combination of both which can be grown in the window-box, the latter is preferable. Besides the plant height,

colour and size of the flower and the time of flowering, the situation (whether sunny or shady) is equally important in choosing the plants. In a sunny situation, tall or medium-tall winter flowers like *Antirrhinum*, China *Aster*, Carnation, *Phlox*, *Dianthus*, *Petunia*, Stocks, *Verbena*, *Arctotis*, *Gerbera* and *Narcissus*, and for the edge dwarf ones like *Ageratum*, *Alyssum*, Pansy, *Viola*, *Mesembryanthemum* and *Nasturtium* (trailing) are ideal. During summer and monsoon *Gaillardia*, dwarf sunflower, Balsam, *Celosia*, French marigold, *Zinnia*, *Amaryllis*, Daylily and Tuberose can be grown at the back, and *Torenia*, *Zinnia linearis*, *Portulaca* and *Zephyranthes* at the edge. In a shady or semi-shady situation a few flowering plants like *Salvia*, *Cineraria*, *Geranium*, *Begonia* (*Semperflorens*), Pansy, *Viola* and *Ageratum* besides some foliage plants such as *Dracaena* (cordyline), *Dieffenbachia*, *Maranta*, *Aglaonema*, *Asparagus*, *Aspidistra*, *Caladium*, *Coleus*, croton and *Ficus elastica* (Rubber Plant) can thrive. Some others like *Sansevieria*, *Scindapsus* or *Pothos* (Money Plant), *Pedilanthus*, *Philodendron*, *Tradescantia*, *Zebrina pendula* and several varieties of cacti and succulents can be grown successfully in shade or partial shade. Trailing foliage plants like *Scindapsus*, *Zebrina pendula*, *Ficus pumila*, *Tradescantia fluminensis* and *Philodendron cordatum* can be grown as droopers in the front edge of the window-box. Miniature and Polyantha roses are also easy to grow if they get plenty of sunlight. If one wants fragrance, *Alyssum*, Stocks, *Verbena*, *Nasturtium*, Pansy, *Viola*, Wallflower, *Narcissus* and Tuberose can be grown.

Table gardens and miniature landscapes. For indoor gardeners the table garden is most rewarding. With suitable arrangements of appropriate types of small house-plants in a dish, bowl, trough, aquarium, terrarium (glass cases) or bottle, it is possible to create delightful miniature landscape for indoor decoration. It is an exciting hobby to plant these long-lasting Lilliputian gardens which can serve as elegant table decorations.

Table gardening provides an opportunity to give expression to one's aesthetic and artistic aptitude. A desert or a woodland scene or alpine and rock garden or formal garden scene or small weathered rocks, and moss in a rock garden produces natural effects. In formal garden designs, small garden paths using small pieces of slate, green lawns raised from seeds and cut occasionally with small nail scissors and miniature flower beds and plants can be used effectively. Miniature landscapes are also placed on a window-sill, book-rack, mantles or wall shelves. Sometimes the planters, particularly the troughs, are fitted with legs and castors so that they may be placed at suitable corners in the room and removed occasionally outside to the verandah or balcony to provide sunshine to plants whenever required.

The plant containers should be simple but elegant and made up of ceramic, clay, glass, plastic, metal or wood. Their shapes can be round, square, rectangular, oval or elliptical. They must be at least 8 cm in depth and convenient in size depending upon individual needs. A suitable size for a trough would be 1 m long, 60 cm wide and 15 cm deep, or a smaller one of about 30 to 60 cm long, 15 cm wide and 15 cm deep may perhaps be better as it

would be easy to lift it. The containers should have 2 or 3 holes at the bottom to ensure proper drainage.

While placing the table or dish garden at vantage points in the room, their placing must be given thoughtful consideration. For a sunny placing, they should be placed near the south window, while a north window is suitable for shade-loving plants; cacti, succulents and other plants requiring medium light can thrive well on the east or west side. If the room does not have sufficient light inside, it is advisable to provide artificial light to the plants. Generally, two 40-watt frosted daylight lamps (sodium vapour lamp) or tubes placed about 30 to 45 cm above the plants and lighted for about 16 hours daily can supply enough light for the proper growth of plants. The soil mixture which is filled in the containers consists of 2 parts of soil, 2 parts of cow-dung manure, 2 parts of leaf-mould and 1 part of coarse sand.

Planting arrangement is an important task. The place where the dish garden is to be kept should be taken into view while planting. When the composition is to be viewed from the front side only, it is better to plant the tall plants at the back, medium-tall in the middle and low trailing types along the edges, preferably hanging down the receptacle. If the arrangement is to be viewed from all sides, the tall plants are best planted in the centre while medium-tall and trailing ones are placed along the sides. The tall plants impart height and boldness to the composition, dwarf plants serve as fillers and cover the soil, and the trailing ones are effective in producing graceful curves. In some compositions 1 or 2 foliage climbers can also be included and trailed on drift wood or dried twigs to produce artistic designs. The composition should be rhythmic and simple. There must be harmony in colour, texture and form of leaves, flowers and plants. Sometimes for a contrast variegated or marbled foliage may be included in the plant arrangements.

There is a bewildering choice of indoor or house-plants which may be used in miniature gardens. While grouping the plants due consideration must be given to their light and water requirements and height and growth habits. The plants grown in a receptacle should have similar requirements of water and light, and preferably have similar growth habits, so that the fast-growing plants may not smother the slow-growing plants. Usually the foliage plants are used for long-lasting effects, but sometimes a combination of both foliage and flowering plants may be more delightful.

Cacti and succulents are excellent subjects for creating desert scenes. The tall *Bryophyllum*, *Opuntia* or *Kalanchoe* may be placed in the background with *Aloe* and *Crassula* in the middle, and *Echeveria*, *Echinopsis* and *Mammillaria* in the front along the edge. There can be innumerable combinations of these plants. For colourful effects one may grow a few flowering cacti also. The 'Norfolk Island' pine (*Araucaria excelsa*), pine seedlings, ferns like *Selaginella*, small ferns particularly the Maidenhair and some other plants can be effectively utilized in producing woodland scene. Among the tall foliage plants, *Sansevieria*, *Monstera deliciosa*, the Rubber Plant (*Ficus elastica*), *Dracaena* and *Dieffenbachia*

are promising, while *Maranta*, *Calathea*, ferns, *Begonia rex*, *Aglaonema*, *Chlorophytum* and *Aspidistra* are a few important medium-tall plants. During appropriate seasons, *Coleus* and *Caladium* may also be added. A few outstanding trailing plants are *Scindapsus* (Pothos), *Asparagus*, *Zebrina pendula*, *Tradescantia fluminensis*, *Ficus pumila* and *Philodendron* (*P. scandens* and *P. cordatum*). The most hardy plants requiring little care are *Sansevieria*, *Philodendron*, *Scindapsus*, *Aspidistra*, *Agave*, *Aglaonema*, *Chlorophytum*, *Dieffenbachia*, *Dracaena*, *Ficus elastica*, *F. lyrata*, *Tradescantia fluminensis* and *Zebrina pendula*. A few flowering plants like the *Amaryllis*, *Narcissus*, *Begonia* (particularly *B. semperflorens*), *Geranium* or *Pelargonium* and *Freesia* can also be grown indoors successfully. Miniature roses are unrivalled in beauty and can be effectively used in creating formal garden scenes.

Regular and proper watering and light are essential in maintaining the plants indoors in a healthy condition. After 2 or 3 years, when the plants outgrow or lose their form, it may become necessary to undo the arrangement and create the composition again with small young plants. This will provide an opportunity to express one's originality.

Terrariums. More than a hundred years ago a London physician, Nathaniel Ward, grew ferns, mosses and palms in a covered glass-case, now called the terrarium. The size of the terrarium can vary according to the need. The convenient size being 1m (length) \times 0.5m (breadth) \times 0.5m (height). Aquarium cases can also be utilized for this purpose. The terrarium has a glass cover at the top which is removed occasionally to provide ventilation which is necessary for the growth of the plant. Since the terrarium is closed, the plants do not need frequent watering, as the moisture from the transpiration of leaves and soil evaporation condenses on the glass, returns to the soil and becomes again available to the plants. It is necessary to provide drainage holes at the bottom of the terrarium, otherwise watering may have to be done with great care to avoid overwatering. If there are no holes at the bottom, a layer of coarse sand and small 65-mm charcoal pieces, about 3 to 6 cm thick, may be spread at the bottom before filling in the soil mixture consisting of 1 part each of soil, leaf-mould and sand. If the level of soil inside the terrarium on a particular side is desired to be raised, it can be done by placing a few small pieces of rocks and filling in the soil around them. The arrangement of plants in the terrarium should be planned before planting. The young and small plants should be firmly planted and watered carefully. Thereafter the top of the terrarium be covered to conserve moisture, which will also help the plants to get established quickly. Overcrowding of plants should be avoided and some space in between the plants should be left to provide a little room for them to grow later. Very fast and vigorous-growing plants should not be included for planting, as they may outgrow quickly and smother other plants. Only healthy, disease and insect-free plants should be planted. With a proper choice of plants and careful watering the plants in a terrarium may live for several years without replacement. However, sometimes one may have to replace those which get

smothered by other vigorous-growing plants or which die due to diseases or insect infestation.

Bowl and dish gardens. Large glass-bowls are also used for growing plants. The mouth of the bowl can be closed by putting a glass-cover over it. The planting in a bowl is done in the same way as in terrarium.

In a dish, trough or shallow bowl the plants are grown without being covered by a glass as in a terrarium or in a bowl garden. Small plant arrangements using suitable types of plants illustrating a particular landscape in a miniature form can be designed in a large dish or trough as has been described earlier. Sometimes in a shallow bowl or dish garden a few metal funnels are inserted in the soil between plants so that these are not visible from outside and some cut-flowers put in them for a temporary colourful display, which is commonly known as *pot-et-fleur*. This arrangement can be an elegant decoration for a dinner-table or a centre-piece table.

Cacti and succulents are ideal for the shallow bowl or dish garden or for growing in pots. A desert scene can be created in the dish garden by planting suitable small cacti and succulents amidst small pieces of stones and pebbles. The dish garden can be placed on the window-sill or used as table decoration in a sunny corner of the living room. It is better to plant cacti and succulents in separate bowls or dishes instead of putting them together. Due care must be taken to allow some extra space for the growth of these plants in the dish, overcrowding should be avoided.

While selecting the species for the dish garden, the size, form, growth and flowering habit, colour of spines, stems, leaves or flowers and time of flowering are some of the main considerations. It will be interesting to include a few flowering species of cacti also (both night and day bloomers). The tall species should be used as background subjects, while the small ones can be put in the front to produce natural and contrasting effects.

Both glazed and earthenware dishes or bowls are commonly used, but the earthenware is preferred for its porosity. The dishes should be about 10 cm deep and must have holes at the bottom for drainage. The size of the dish is one's own preference but it should not be too large. The soil mixture should consist of 2 parts each of soil, fine leaf-mould, sand and crushed brick and 1 part each of old lime scrapped from walls and crushed wood charcoal. The bottom holes in the dish must be covered with crocks before filling in the soil mixture.

Among the flowering cacti *Heliocereus*, *Brozicactus*, *Rebutia*, *Lobivia*, *Notocactus*, *Mammillaria*, *Echinopsis* and *Parodia* are suitable for the dish garden; the first two tall species are ideal for the background. The tall flowering succulents like *Cotyledon*, *Crassula*, *Euphorbia milli* (syn. *E. splendens*), *Gasteria*, *Kalanchoe*, *Bryophyllum*, *Sedum*, *Aloe* (especially *Aloe variegata*) are the most dependable plants, while *Haworthia* and *Echeveria* are smaller species of the flowering succulents other than cacti. *Ferocactus*, *Oreocereus*, *Opuntia*, *Echinocactus*, *Trichocereus*, *Cereus* and *Cephalocereus* though flower very rarely but are attractive in form.

The success of growing cacti and succulents depends mainly on adequate watering, as overwatering or water stagnation near the base often causes rotting, weak growth and death of plants. Sufficient light and humidity and the right amount of water are the secrets of their successful culture.

Bottle gardens. Plants, chiefly ferns, can also be grown in a large bottle as in a terrarium. A carboy is ideal for this purpose. A bottle may be thoroughly cleaned with soap and water and made to sparkle by rubbing it with a clean cloth. A mixture of coarse sand and crushed charcoal may be poured into it to form 3-cm thick layer at the bottom and later a mixture of equal parts of soil, sand and leaf-mould is put in through a paper funnel. While introducing the soil care should be taken that it does not cling to the sides of the bottle. Small plants can be introduced with a fork or dessert-spoon tied to thin bamboo canes with wire or tape. With these small tools it is not difficult to manipulate the soil around the roots of the plant. The plants should be watered lightly with a tube after planting. The bottle is then corked tightly. When planting, great care should be taken to avoid sprinkling soil over the leaves of the plants. Any soil resting on the foliage can be washed off with a fine sprayer. If desired, one can get the cork fitted with a lamp-holder to use the bottle garden as an attractive and novel table-lamp. The bottle garden, like a terrarium, needs very little watering. Watering is done normally once in two months. Bottle garden should not be exposed to direct sun for a long duration, as the plants will be heated up. A bottle garden is displayed in semi-shade.

CHAPTER 3

POTS, CONTAINERS AND PLANT FURNITURE

EARTHENWARE pots are most commonly used for growing house-plants. Glazed clay and China (porcelain) pots, dishes, shallow bowls and troughs are also available. A variety of pottery containers in contemporary designs are also available in the shops. Earthenware pots are cheaper and being porous provide better aeration of soil. Metal receptacles of brass and copper are also used. However, these become hot quickly during the summer and therefore are not very useful for growing plants, especially in a warm climate. Plastic pots, dishes and bowls are also used, particularly for growing cacti and succulents which need dry conditions. These are not suitable for growing moisture-loving plants like bromeliads, orchids and ferns. Large plants can be grown in cement or wooden planters or wooden barrels. The wooden planters should preferably have castors to facilitate their movement whenever required. Large rectangular planters made of seasoned wood are best for placing pots inside them. The wooden planters must be painted from inside as well as outside with waterproof paint. Earthenware pots and pans should be frequently cleaned and painted outside with burnt sienna (*geroo matti*), if these are not painted with waterproof oil-paints. Similarly, the metal receptacles and wall brackets may be kept clean and polished with brasso or any other similar metal polish. The pots can be plain or ornamented in design, depending upon the interior furnishings of the room with which these should harmonize in colour as well as in texture. The shape of pots, bowls, dishes and troughs may be round, oval, elliptical, cone-shaped, rectangular, square, oblong, heart-shaped or of any other shape. The pots and other receptacles must have drainage holes at the bottom.

The individual pot can also be placed inside a metal, plastic, reed or cane-basket or a cover. Waste-paper baskets made of metal, plastic, reed or cane are ideal for this purpose. Baskets of round, rectangular or hexagonal shape made of wood, cloth or raw silk can also be used. It is necessary to stand the pots on platters or saucers. A group of pots can be placed on a metal tray. The metal trays commonly used by bakers and the tea-trays are ideal for this purpose. The water drip after watering will collect in these platters and trays and thus save the furniture or floor from water stains. However, it is better to stand the pots on a block of wood or on pebbles and stones in a platter and try to avoid direct and constant contact of plants with water which is harmful for their growth. This also provides adequate humidity to plants, especially during summer months. The potted plants kept on stand or wall brackets should

be watered carefully after placing a tray or dish below for collecting excess water.

Pots can be placed on plant stands which are usually made of metal. The plant stands and wall brackets may hold a single pot or more. The wall brackets are ideal for growing drooping plants like *Scindapsus* and *Zebrina pendula*. The large, rectangular wooden or metal planters often have long legs or are placed on metal stands. A tea-trolley is commonly used for keeping pots. The potted plants are also displayed on wall shelves, wall racks or on the shelves of an open bookcase or a similar wooden furniture. The wall racks, trolley, planters or shelves can be fitted with lights, either fluorescent tubes (40 watts) or incandescent bulbs (40 to 60 watts), about 30 to 45 cm above the plants. The plants need artificial light for about 16 hours a day. Some plants such as African Violet and *Gloxinia* can be grown exclusively under artificial light.

CHAPTER 4

CULTURE OF HOUSE-PLANTS

INDOOR gardeners must always remember that the rooms in which the house-plants are kept are built primarily to suit their own requirements rather than to those of the plants. A proper environment is essential for the healthy growth of plants and it varies with the different house-plants. The success in growing a house-plant depends largely on the ability of the grower to provide a satisfactory environment. The environment of a plant comprises several physical factors like light, temperature, humidity, water, soil and nutrition as well as biological factors like pathogenic organisms (fungi, bacteria and viruses), insects, weeds and the gardener. These environments are interrelated. A knowledge of these environmental factors, their interrelationship and their impact upon the growth of the plants is important in growing house-plants successfully. The culture of house-plants is most fascinating and rewarding.

Light. Plants require light for their growth. However, the intensity of light needed by them is not the same. A few plants like *Aspidistra*, *Aglaonema*, *Dieffenbachia picta*, *Philodendron*, *Syngonium* and *Sansevieria* require very little light when compared with the Indian Rubber Plant, croton, *Coleus* and many flowering plants like Geraniums, *Poinsettia*, *Kalanchoe*, *Begonia* and others which need full sunlight for best growth. Usually green-foliage plants require less sunlight than those with variegated or coloured leaves like crotons, *Coleus* and *Caladium*. The plants requiring plenty of sunshine can grow best on south windows, while those needing medium light may be placed near east and west windows. The shade-loving plants may be placed on the north side of the room. If the plants requiring partial shade are grown on south window, the curtains or drapiers may be drawn to check excessive sunlight.

House-plants need 15 to 25 foot candles minimum light for 16 hours a day for their proper growth. The plants requiring plenty of sunlight (50 to 100 foot candles) are ferns, *Peperomia*, *Scindapsus* and *Dracaena*, and those plants requiring low light (15 to 25 foot candles) are *Aspidistra*, *Aglaonema*, *Sansevieria*, *Philodendron* and *Syngonium*. These light readings will give a rough idea about the sunlight available at a particular location. However, it is better to measure the intensity of light with the help of an exposure meter which is commonly used by photographers. About 12 to 14 reading on a Weston light meter in the home is ideal for most of the foliage plants. While 14 to 16 reading may be best for those requiring plenty of sunlight and 9 to 10 for shade-loving plants.

The plants grown in poor light will show symptoms of etiolation, weak growth, pale leaves and lanky growth. The older leaves will die and drop off

and the new ones will be smaller in size. When grown in bright sun, the foliage of the partial shade-loving or shade-loving plants such as *Dracaena*, *Dieffenbachia* and *Philodendron* will get scorched or sun-burnt, and later becoming brown and might dry up eventually.

If the room does not get sufficient sunlight, artificial light may be supplemented by daylight. Fluorescent tubes or incandescent bulbs or preferably a combination of both may be used. Usually one fluorescent tube of 80 watt or two 40 watt each and 40 to 60 watt incandescent lamps placed about 30 to 45 cm above the plants and illuminated for 16 hours a day will provide sufficient light for the growth of the plants. Spot lights when placed at appropriate site, but not too near the plants, can be functional as well as valuable to accent the plants. In the USA, Europe and the UK automatic time switches are fitted in these light arrangements. Planters having arrangements for light designed specially for growing house-plants are also available in these countries. For an enthusiastic grower it should not be difficult to make planters and light arrangements. Sodium vapour lamps are also used for artificial lighting.

Temperature. Most of the house-plants grow best at day temperatures ranging from 18° to 24°C and night temperatures about 10°C lower. A few foliage plants like *Dracaena*, *Nephtytis*, *Philodendron*, Indian Rubber Plant, *Scindapsus*, *Aglaonema*, ferns, *Caladium*, *Coleus* and cacti and succulents thrive best at a higher day temperature (21° to 26°C). *Begonia*, *Amaryllis*, *Geranium*, *Fuchsia*, *Poinsettia*, many bulbous plants, *Aspidistra* and *Sansevieria* require a cooler temperature (15° to 21°C). In homes, particularly in northern India, the rooms become too hot during summer and quite cold in winter. The injury to house-plants is usually due to warmer temperature and not due to cold, as the plants generally grow satisfactorily up to a temperature of 15°C. It is difficult to control temperature inside the rooms unless these are fitted with air-conditioners. The heat injury results in weak and spindle-shaped growth of plants and browning of leaves.

Humidity. Relative humidity of 40 to 60% is best for plant growth. The humidity is to some extent related to temperature. During summer it is very low, while in the rainy season it is very high. The humidity can be increased by occasionally spraying fine mist of tepid water on the foliage, sponging the leaves with water and placing the pots on moist sand, gravel or pebbles kept in platters or trays. In kitchen and bathrooms the relative humidity is higher than in the living room. Low humidity may cause tip-burn in leaves of foliage plants like *Dieffenbachia* and *Dracaena*.

Ventilation. Fresh air is required by plants for survival, but not to an extent needed by man or animal. Droughts should be avoided and therefore a location between doors or windows where there are cross-currents of air is not suitable. Natural gas from stoves or furnaces is harmful to house-plants. The affected plants become yellow, drop their foliage and appear pale.

Watering. Successful growth or failure of a house-plant depends largely on watering. One of the main causes for the injury or death of house-plants

is improper watering, particularly inadequate or overwatering. The requirement of water varies with different house-plants. Cacti and succulents need less frequent watering than *Cyperus* (Umbrella Plant) and *Calla* which can grow even under wet conditions. Besides this, the frequency of watering will also depend on the stage of plant growth, size of the plant in relation to its pot, soil, light temperature and humidity. Small pots which dry out more rapidly require more frequent watering. Plants in bloom need more water than those in young stages of growth or those which are newly potted. Similarly, on a sunny day, when the temperature is high and humidity low as in summer months, plants require watering more frequently than during winter when the temperature is low and the plant growth in general is slow. A heavy soil with plenty of clay will require less frequent watering than a sandy-loam soil.

Wilting is often a common indication of insufficient soil moisture, but it may also be due to constantly saturated soil. A plant removed from a dark corner to a sunny situation may also show signs of wilting. Therefore, wilting is not always a definite indication of lack of soil moisture. It is a bad practice to water a plant when the leaves wilt. A few simple and common practices adopted to find out whether the soil is dry are often very useful. If a knock on the side of the pot with a wooden hammer or a sharp rap with knuckles produces a metallic or hollow ringing instead of a dull thud, it would indicate lack of soil moisture. By inserting the fingers in the top-soil or by seeing the colour of the soil one can judge fairly accurately whether the pot needs watering; a dry soil will appear greyish white. If you are not able to judge the soil moisture by any one of these methods or when you are in doubt, the best way is to turn the plant out of its pot by tapping the rim of the pot to loosen the plant so that the earth-ball emerges intact. Examine this earth-ball and decide whether the plant needs water and then replace it in the pot.

Pots can be watered both from top and bottom. Watering from the bottom can be done through a wick or by half submerging the pot in a shallow bowl or basin of water or by placing the pot in a saucer full of water. In these the water rises up through the bottom hole and as soon as it reaches the top-soil, remove the pot from water, drain off the excess water and place the pot again at the site where it was before. Watering from bottom is better than that from the top, as it avoids overwatering and is preferable for cacti and succulents. It is always a good practice to saturate thoroughly the soil while watering and then again water it when it is on the verge of drying but before it is completely dry.

For indoor gardeners it is sometimes a problem to water their plants when they are away from home on a holiday. In such cases watering through a wick is useful. The pot is kept in a saucer or dish and a moistened wick is placed in a saucer. One end of which is kept immersed in a bucket or any other large receptacle filled with water. The water slowly passes from the bucket to the dish and rises up in pot and is replenished through the wick whenever the soil is dry. In Europe, England, USA and other countries self-watering flower-pots

having a fibre-glass wick are available. Another method is to stand the pot on a wooden block in a saucer filled with water, which comes just to the top of the block and thus the roots will absorb the necessary moisture when-ever needed. In yet another method, which is also useful, 2 or 3 thin bamboo stakes slightly higher than the plant are inserted in a soil along the sides after saturating the pot with water and then an alkathene bag is slipped over the stakes and the plant and fastened to the pot with a rubber-band. This helps conserve the moisture and keep the soil wet. The pot should not be kept standing directly in water as it will constantly saturate the soil which is harmful to the plants.

Soil. The soil for house-plants should contain coarse soil particles to ensure drainage, adequate aeration to the roots and sufficient organic matter. If the soil is heavy, it is advisable to mix coarse sand and crushed charcoal for proper drainage. A good soil moisture for house-plants consists of 2 parts soil and 1 part each of organic matter (either leaf-mould or cowdung manure) and sand. For foliage plants a soil containing equal parts of soil and organic matter is ideal. Small quantities of wood ashes, bone-meal or superphosphate and crushed charcoal are also added to the soil mixture. About 1 tablespoon of bone-meal or a teaspoon of superphosphate may be added to a 15-cm pot of soil. The soil mixture should neither be too dry nor too wet at the time of potting.

Feeding. Generally the nutrients present in the pot soil and the organic matter are adequate for the growth of house plants. The plants do not need extra feeding unless they become pot bound. You can ascertain this by turning the plant out of its pot and examining the root ball; if it has matted roots it would indicate that the plant should be transferred to a larger pot. If you don't want to do repotting you can remove the top few centimetres of the soil from the pot and replace it with a mixture of equal parts of soil and leaf-mould or cow-dung manure, to which a small amount (1 tablespoon) of bone-meal is added. Pot-bound plants can be fertilized by applying half to one teaspoon of any complete fertilizer containing all the three essential nutrients, viz. nitrogen, phosphorus and potassium. Complete fertilizers are available in the market, sometimes in the form of tablets and liquid. The fertilizer should be raked in the soil a little away from the base of the plant and the soil watered heavily immediately. It should be given only once every two months or so. Do not apply fertilizers on a dry soil or when the plants are resting or dormant during winter. Fertilizers should be applied when the plant is actively growing. One must remember that rapid growth of house-plants is often undesirable and therefore fertilizers must be applied with care. Soot water and liquid cowdung manure are also beneficial, especially to foliage plants.

Weak growth and unhealthy appearance of house-plants are not always indications of poor nutrition as is often believed by many growers. It is advisable to ascertain the cause of unhealthy growth, which may perhaps be due to inadequate or overwatering, strong or poor sunlight, water stagnation, cold injury or excessive dryness. A fertilizer is effective only when the plant is pot bound and not for other ailments. Application of 1 teaspoon of carbonate of

ammonia dissolved in 1 quart of water to foliage plants brightens their leaves. In the USA and other countries, there are some proprietary chemicals in aerosol which are sprayed on foliage plants for giving a shine to the leaves.

Potting. Before potting, a pot appropriate to the size of the plant may be selected. Potting in very large pots is harmful to plants as it tends to deplete the soil of its nutrients by leaching before new roots develop and occupy the soil. The pot should be thoroughly cleaned and then crocks put over the drainage hole. The plants should be set in the centre of the pot and the soil filled gently around the roots. When the pot is full the soil may be made firm by pressing with fingers leaving about 1 to 2 cm at the top, below the pot rim, to allow for water. The potted plant should then be watered thoroughly and placed in partial shade until it established itself.

For transplanting young seedlings into pots, the drainage hole may first be covered with crocks and the soil mixture filled; then a hole with a dibbler or a finger may be made in the centre, large enough to receive the seedling, and then firm the soil with fingers leaving 1 cm space below the rim of the pot for watering. The seedling should be watered thoroughly and the pot should be kept in partial shade for a few days before shifting it to its location inside the room.

If there is no drainage hole in the pot a 2.5 or 4 cm thick layer of coarse sand or gravel should be spread at the bottom to ensure good drainage.

Repotting. When a plant becomes pot bound that is when its roots get matted around the outside of its earth-ball it needs repotting. House-plants require repotting occasionally depending upon their growth. A few plants such as cacti, succulents and *Aspidistra* are slow-growing and do not need frequent repotting, while others like *Geranium* and *Begonia* are fast-growing and require shifting to a larger pot at least once a year. The plants are generally repotted during the rainy season, when it is easier for them to become established and form new roots. A day prior to repotting, the pot should be watered lightly to facilitate removal of the earth-ball intact from the pot. This can be done by placing fingers over the soil near the base of the plant, turning the pot upside down and tapping its rim on a table edge. The whole earth-ball will emerge intact from the pot. The presence of matted roots indicates the need for repotting. The plant should be set in a larger pot in the centre after removing a little of the soil from its earth-ball. Then the soil should be put in the pot to set the plant to a right height and the new soil mixture filled around the roots. The same soil mixture used for potting may be utilized in repotting and firmed with fingers. Below the pot rim 1 cm space may be left to allow for water. The plant should then be thoroughly watered and placed out of direct sun until it is well established.

Pinching and pruning. In pinching, the apical shoots or tips are removed to encourage side growth. This is commonly practised in *Coleus*, *Geranium*, *Pelargonium*, *Fuchsia* and *Chrysanthemum*. It makes the plant bushy. Pruning is done to control the shape of the plant or to stimulate new growth. Roses are



Gloxinia produces brightly coloured, large, open, bell-shaped flowers in profusion well above the thick, velvety and green foliage.



A group of foliage plants. They can be placed either in suitable groups as bold accents or singly as a spotlight depending upon the size, colour and style of rooms.

Anthurium—A dwarf, compact plant with dark green, velvety, heart-shaped leaves having attractive silvery-grey veins.



pruned once a year to encourage new growth and for production of better flowers. *Bougainvillea*, *Pelargonium*, *Geranium* and *Fuchsia* are generally pruned after flowering to maintain their shape, while *Chrysanthemum* is headed back about 10 to 15 cm above the ground after flowering to stimulate the production of suckers. Sometimes a trailing plant like the Wandering Jew (*Zebrina pendula*) or *Scindapsus* may need light pruning of old and dry shoots or thinning out to check its heavy growth.

Faded flowers should be removed from all flowering plants and should not be allowed to seed. It will help in the growth of plants. In *Coleus*, the inflorescence should be pinched off as soon as this emerges to encourage good vegetative growth.

Training. Climbing plants require support to climb and for this purpose moss-sticks are ideal. The moss-sticks are placed in the centre of the pot. A 25-cm strip of 1 cm wire-net or chicken wire-net, about 75 to 90 cm wide, rolled in the form of a cylinder and fastened to the edges with thin wires at intervals of 15 cm make a good moss-stick. At the bottom of the cylinder two small sticks are pushed through the holes to keep the cylinder straight and erect in the pot. The cylinder may be filled with a mixture of moss and vermiculite, or moss alone and packed firmly. The cylinder is put vertically straight in the centre of the pot and the potting mixture filled. It is useful to push a small pot at the top of the cylinder in which water may be filled occasionally to keep the moss moist, as it will help the vines to establish and twine around the cylinder. About 3 to 4 young vines be planted around the cylinder according to the size of the pot and the vines fastened to the cylinder with hair pins.

A simpler moss-stick can also be made. For example take a stout stick or bamboo or polythene pipe, about 1 m tall, and put a thick layer of moss around it throughout its length and tie it firmly with a string. This moss-stick can then be placed in the pot in the same way as described above. Vines can also be trained on a trellis, bamboo sticks or strings fixed in the pot. They may also be trailed on a trellis or strings to form a screen for dividing space in a large room.

Tall climbing cacti and a few climbers can be trained and supported on bamboo stakes.

Cleaning. The foliage of house-plants must be cleaned regularly by sponging with water, preferably with lukewarm water to remove dirt, dust and grease. A small amount of milk or a few drops of vinegar may be added to the washing water to improve the appearance of leaves. Syringing the foliage with a fine spray of water is also useful, particularly during summer months. The hairy and silver-grey leaves should be gently cleaned with a soft brush. The hairy leaves of African Violet and Rex Begonia may be gently brushed with a soft-bristled paint-brush.

CHAPTER 5

PROPAGATION

HOUSE-PLANTS are propagated by seed, stem cuttings, leaf cuttings, divisions, runners and air layering. *Asparagus*, cacti, *Coleus*, *Impatiens*, *Kalanchoe*, Bromeliads, *Begonia*, *Calceolaria*, *Cineraria*, *Salvia*, African Violet, *Cyclamen*, *Gloxinia*, Primrose and many others are raised from seeds. Those multiplied by stem cuttings are *Aglaonema*, *Coleus*, *Euphorbia milii* (syn. *E. splendens*), *Dieffenbachia*, *Dracaena*, Ivy, *Ficus lyrata*, *F. elastica*, *Fatshedera*, *Impatiens*, *Nephtytis*, *Peperomia*, *Philodendron*, *Geranium*, *Fuchsia* and *Poinsettia*. Leaf cuttings including leaf bud and leaf are used for propagating *Cissus*, *Kalanchoe*, *Philodendron* and *Scindapsus*, while in African Violet, *Gloxinia*, *Peperomia*, Rex Begonia, *Sansevieria* and *Sedum* only leaf cuttings are used. In *Sansevieria* and Rex Begonias a portion of the leaf can also be utilized for propagation. Plants of *Coleus*, *Ficus pumila*, *Aphelandra*, *Impatiens*, *Begonia* (other than Rex), *Tradescantia* and *Pilea* are propagated from tip cuttings. Some plants like *Dracaena*, *Dieffenbachia* and *Philodendron* can be multiplied from sections (2.5-cm long pieces) of stem which are inserted horizontally on the rooting medium. African Violet, *Aglaonema*, *Asparagus*, *Aspidistra*, *Chlorophytum*, Begonias, Boston fern, Bromeliads, *Cyperus*, *Echeveria*, *Maranta*, *Pandanus*, and *Sansevieria* can be multiplied by division. Bromeliads are reproduced from offsets which are formed on the stem under the rosette. *Chlorophytum capense* (syn. *C. elatum*), *Saxifraga sarmentosa*, Boston fern and some species of Bromeliads may be multiplied from runners or by offsets. The plants which are reproduced by division can also be multiplied from runners. Air-layering is commonly practised in *Dieffenbachia*, *Dracaena*, *Ficus elastica* and *Ficus lyrata*. Any plant which is propagated from stem cuttings can also be multiplied by air-layering.

Seeds. For sowing seeds, wooden flats (30 cm × 30 cm × 8 cm) or earthenware pans are used. The soil mixture contains 2 parts soil and 1 part each of sand and leaf-mould (or peat). Vermiculite can also be used for sowing seeds. Before sowing seeds, soil should be made fine, free of lumps and weeds. Very small seeds may be scattered over the surface while others should be sown in rows. Small wooden stakes or labels may be used to identify each variety or species. After sowing, the seed pans or flats should be watered with a watering can having a fine hose. It is preferable to water the plants from the bottom by half submerging the pans in a basin of water or through a wick, particularly in case of very fine seeds. The flat or pan should be covered with glass or plastic paper to provide darkness. As soon as the seedlings appear, the glass cover may be removed and the pans put in partial shade. The seedlings may be

thinned out, if necessary, or pricked out, i.e. to transplant them to another pan when these develop the first true leaf. Later, after the seedlings have developed 3 or 4 leaves and attained sufficient height, they may be transplanted in single 7.5 cm pots and moved to bigger pots, if needed.

Stem cuttings. The rooting medium for stem cuttings consists of coarse sand, vermiculite or a combination of sand and peat. Since in India true peat is not available, a combination of leaf-mould and sand be used. The cuttings are taken just below a node or leaf axil. Before inserting the cuttings dip their ends in Seradix or any other rooting hormone as it will facilitate rooting. The cuttings may be kept moist until they have rooted. This can be done either by spraying with a fine atomizer frequently or by covering the pot containing the cuttings in a polythene bag, or placing it under a glass-case. The rooted cuttings can be transferred to a light soil mixture containing equal parts of fine sand, soil and leaf-mould or peat.

Leaf cuttings. Leaf cuttings may be inserted in water, sand or vermiculite. Leaf cuttings of *Peperomia*, *Scindapsus*, African Violet and *Sansevieria* can easily root in water. While propagating from leaf sections such as in Rex Begonia and *Peperomia*, it should be ensured that each portion includes a part of the main vein. In Rex Begonia, the leaf may be spread on the rooting medium and fixed with toothpicks and each main vein cut with a sharp knife without disturbing the leaf. New plants will develop from these cut ends.

Division. When the plant has made luxuriant growth and appears overgrown it can be divided for multiplication. The plant may be tossed out with its earth-ball intact, the soil shaken off and the clump divided into two or more portions. These new sections may be potted and kept away from direct sunlight for a few days until they are established.

Runners. A few plants like *Chlorophytum* and *Saxifraga sarmentosa* throw out aerial runners forming new plants at their ends. In a small pot filled with moist soil mixture containing sand and peat or leaf-mould the runner (florets or baby plants) may be pinned to it and watered frequently. After it has formed new roots the runner may be cut and the new plant is established.

Air-layering (marcottage). When the plant becomes lanky as in the case of *Dieffenbachia*, *Dracaena*, croton or Rubber Plant, air-layering can be done to replace the old ones. A length-wise half-cut or notch may be made in the stem at the point where new roots are desired, or a ring of bark be removed and the cut wrapped in moist moss and enclosed in a plastic cover with the ends tied with twine. Sometimes saw-dust or good garden soil is also used in place of moss. If the ties are firmly made no water should evaporate and no watering will be necessary. After about 4 to 6 weeks, when the roots have developed in the moss ball, they may be cut below the roots and the newly rooted plant is transplanted in a pot. Watering the old plant regularly will later produce a new top.

Tissue culture. Many house-plants are now propagated by tissue culture in laboratories abroad. This technique is used for mass multiplication of disease-

free and uniform plants rapidly on agar-based nutrient medium or liquid nutrient medium in test-tubes, jars or bottles under aseptic conditions in the laboratory. Its other advantage is that plants can be multiplied in the laboratory round the year. Later from the laboratory the tissue-cultured plants are transferred into pots and kept in climate-controlled greenhouses for hardening before these are planted outside in fields or pots. A few commercial tissue-culture laboratories in private sector have been established recently in India also for propagation of ornamental plants for domestic market and export.

CHAPTER 6

PLANT PROTECTION

Diseases. House-plants are less affected by diseases. The common diseases noticed are stem-rot and root-rot found in cacti and succulents usually caused by soil-borne fungi; leaf-spot caused by fungi, bacteria or viruses; and powdery mildew caused by fungi. In the case of stem-rot the affected parts may be removed and sulphur dusted on them, and for root-rot soil sterilization is necessary. This is done by keeping the moist soil in an oven at 82°C for 30 minutes or by treating the soil with formalin or Aldrin. Leaves showing symptoms of leaf-spot (yellow and brown spots) should be removed and burnt; sometimes spraying with Bordeaux mixture or Dithane M-45 helps to control the disease. Powdery mildew, which causes greyish-white powdery coatings on stems and leaves, can be controlled by dusting with flowers of sulphur, Karathane or Bavistin (or Benlate).

Insects. House-plants are often attacked by insect pests. Most of them can be easily picked up and destroyed. The common insects are red spider mites, aphids, mealy bugs, scale, green-fly, white-fly and thrips.

The red spider mites, which inhabit the underside of leaves of some plants like *Dracaena* and *Azalea* and form delicate webs, can be controlled by spraying nicotine sulphate, Sumithion, Kelthane or Malathion. The small, green, black aphids that adhere to the new growth or buds on Begonia and Tulips during cool and cloudy weather are best controlled by a spray of nicotine sulphate and soap, Basudin, Metasystox, Nuvacron or Malathion. Mealy bugs showing small cottony patches on the underside of the leaf chiefly along leaf veins or at leaf axils on African Violet, *Begonia*, cacti, *Coleus*, *Fuchsia*, *Poinsettia* and Indian Rubber Plant are small sucking insects, which can be removed by touching the affected parts with a brush or cotton swab dipped in a solution of equal parts of alcohol and water. Scale insect is another nuisance in many house-plants. Mature scales are brown, whereas young ones are pale green and are found on *Aspidistra*, cacti, ferns, Ivy, palm, *Cycas* and Indian Rubber Plant. The affected plant may be dipped in a dilute solution of nicotine sulphate or sprayed with Nuvacron or Metacid or Sumithion or Malathion or wiped with diluted alcohol as suggested for mealy bugs. Washing the plants at regular intervals helps to control the scales. Thrips are brown or black sucking insects which live on small leaves around the growing point in *Azalea*, *Fuchsia*, *Cyclamen*, Arum and rose. These can be controlled by spraying a nicotine insecticide, rogor or Nuvacron or Malathion. White-fly found on *Fuchsia* and *Geranium* and green-fly are controlled by spraying nicotine-soap solution or Malathion. Small

white or greenish mites are also found on African Violet, *Cyclamen*, *Geranium*, *Begonia* and *Crassula*. They can be controlled by spraying Sumithion or Rogor. Caterpillars may also sometimes attack some plants and these may be controlled with sprays or dusting of Ekalux, Nuvacron or Nuvan.

CHAPTER 7

POPULAR HOUSE-PLANTS

THERE are innumerable species and varieties of house-plants. These include both foliage and flowering plants, and also those possessing both attractive leaves and flowers. These house-plants vary considerably in respect of their natural habitat, which ranges from desert to alpine including several from tropical forests, subtropical and temperate regions. Since, unlike some other countries, the rooms in Indian homes are neither air-conditioned in summer nor heated during winter the house-plants have to be grown under ordinary room temperature and humidity. For this reason many of the house-plants do not thrive equally well both in the plains and in the hills. Nevertheless, there is a bewildering choice of house-plants for the indoor gardener. About a hundred different popular kinds of house-plants including foliage and flowering are described in the following pages. These have been grouped as follows: Foliage plants, Ferns, Palms, Bromeliads, Cacti and Succulents, Flowering plants, Temporary display flowering plants, and Bulbous flowering plants. In India, due to varying climate in different parts, the date of sowing or planting will differ widely in different regions. The dates of planting suggested herein may be only a general guide.

FOLIAGE PLANTS

Aeschynanthus marmoratus

FAMILY: Gesneriaceae

A scandent plant with ovate, waxy, dark green leaves, reticulated with chocolate-green veins and purple bands underneath.

Aglaonema commutatum

FAMILY: Araceae

ORIGIN: South-western Asia: Philippines

It possesses graceful, glossy, grey-green, lance-shaped leaves and grows about 60 cm tall. It grows best in partial light and at 18° to 26°C. Soil should remain moist but not wet. It can also grow in water. It is a dependable house-plant. There are other species also which are used as house-plants, e.g., *A.*

pseudo-bracteatum having irregular, golden-yellow markings in the centre of the dark grey-green leaves and *A. treubii* producing bluish green leaves with attractive silvery patterns. *A. crispum* 'Roebelinii' (*Schismatoglottis roebelinii*) has large pointed leaves which are greyish green with silver variegation. *A. modestum* produces leathery, waxy, green leaves. In *A. marantifolium* the leaves are long, lanceolate, deep green with greenish grey feather-like design. The two popular varieties of *A. pseudo-bracteatum* are 'Malay Beauty' having long and broad leaves, deep green in colour but marbled with milky-green, and 'Silver Queen' with lanceolate leaves having greenish silver splashes on deep green background. A few other species are *A. simplex*, *A. pictum*, *A. nobilis* and *A. pictum gracile*. *Aglaonema* 'Abidjan' with broad, lanceolate, milky-green leaves having feather-like variegation and *Aglaonema* 'Fransher' with variegated milky-green, fleshy, lanceolate leaves are the two attractive *Aglaonema*.

Alocasia

FAMILY: Araceae

ORIGIN: Tropical Asia

Alocasia is an attractive foliage plant. Numerous species and hybrids of this genus are grown for ornamental purposes. Some of the important species are *A. argyrea* having peltate leaves with grey bands; *A. amazonica* with very dark green leaves and contrasting white veins and scalloped white margins; *A. lowii* var. *grandis* having deep metallic bluish green leaves with silvery veins and grey margin, and purple underneath; *A. sanderiana* having silvery-green indented leaves with white ribs; and *A. zebrina* with large leathery green leaves, light stem with brown zebra-like variegations. *Alocasia* 'Hilo Beauty' is a small plant with bluish black stalks and thin leaves, medium green marked with irregular areas of coloured blotches. Another commonly grown species is *A. macrorrhiza* var. 'Variegata' which has thick stem, fleshy leaves with wavy edges and light green blotches mottled with white. *A. cuprea* is another rare and beautiful species. The leaves of *Alocasia* are sagittate-cordate, long-stalked, long and broad. The underground stems are short.

The plants require plenty of water and a moist and well-drained soil. They thrive in warm, moist and humid conditions. They require partial shade. Liquid manure may be applied once a fortnight during the growing period. The plant can be propagated by suckers, cuttings or seeds. It prefers moderately moist soil.

***Ananas comosus* 'Variegatus'**

FAMILY: Bromeliaceae

An attractive plant having gradually arching leaf rosette; leaves with broad, ivory bands along margin and red spines; centre of rosette rosy red.

Anthurium clarinervium hybrid

FAMILY: Araceae

A dwarf, compact plant with dark green, velvety, heart-shaped leaves having attractive silvery-grey veins.

Araucaria excelsa

FAMILY: Pinaceae (Araucariaceae)

ORIGIN: Norfolk Island

This tall plant, resembling a Christmas tree, has horizontal tiers of symmetrically arranged branches with green, needle-like leaves on the central stalk. It thrives in semi-shaded situations and prefers moderately moist soil. Under too dry conditions its needles become brown and drop off. It should be left undisturbed in the same pot and kept away from droughts. An annual top-dressing of organic manure and a few applications of liquid manure are beneficial. It can be grown in north of east windows. It is commonly propagated from seeds.

The three other common species are *A. cunninghami* and *A. columnaris* (*A. cookii*) with soft needles and *A. bidwillii* having dark green prickly needles. *A. excelsa* thrives better in the hills or in areas having mild climate like Bangalore.

Asparagus

FAMILY: Liliaceae

ORIGIN: South Africa

Two commonly grown species are *Asparagus sprengeri* or *A. densiflorus* 'Sprengeri' (Asparagus Fern) and *A. plumosus* or *A. setaceus* (Emerald Feather). The former possesses needle-like leaves borne on long, trailing and thorny stems. It is ideal for drooping and hanging baskets. Its inconspicuous, small, white flowers borne in winter are fragrant. *A. plumosus* has dark green, plume-like leaves on smooth wiry, trailing stems. Its dwarf variety *nanus* is shrubby. In the variety *A. plumosus* 'Pyramidalis' (*A. setaceus* 'Pyramidalis') stems grow erect in clusters having needle-like leaves. The other attractive species are *A. mayeri* (*A. densiflorus* 'Myers') with erect, plume-like (foxtial) branches having needle-like, dark green leaves; *A. falcatus*, a climbing plant with slender branches and bright green sickle-shaped leaves borne in clusters; and *A. densiflorus myriocladus* (*A. myriocladus*), an erect plant with many zig-zig branches which look like long dark green, thread-like leaves.

Both species require rich soil and plenty of water. Occasional application of liquid manure is helpful. They thrive well in partial shade and at 15° to

26°C. The dry and old stems should be removed frequently. Both are useful as trailing plants and *A. sprengeri* can be used as an attractive drooping plant

Aspidistra lurida

FAMILY: Liliaceae

ORIGIN: China

The plant is rugged, stemless and slow growing. It thrives exceedingly well under the least favourable conditions and can grow in dark and shaded corners. It is the most dependable plant for beginners. It is best grown on north, east or west sides. The leaves arising from the root-stock are large, broad, oblong and leathery. The foliage should be occasionally sponged with warm soap-water. The plant needs humus in the soil and may be watered heavily when soil comes moderately dry. There is also a variegated variety of *A. lurida*.

Begonia rex

FAMILY: Begoniaceae

ORIGIN: Assam, India

This is a rhizomatous *Begonia* prized for its foliage. Its leaves are fan-shaped and lop-sided, hairy with toothed edges and silvery white or deep crimson with attractive and intricate patterns; in some the foliage has a glistening metallic sheen. It can be grown in semi-shade and prefers moist and rich soil and humidity.

The other fibrous-rooted species are *B. haageana*, a native of Brazil, having hairy, olive green leaves which are red on lower side with pale pink flowers borne almost throughout the year; *B. maculata* with leathery, green, somewhat wavy foliage with silvery-white blotches on the upper surface and bright crimson beneath; and *B. metallica* which is tall with glossy, olive-green leaves having metallic purple veins and red beneath with light pink flowers. The species *B. masoniana* (Iron Cross Begonia), a native of Malaysia, has small, rounded, bright green leaves with a purplish cross in the centre. Its leaves resemble those of *B. rex* in shape. The dwarf species *B. auriculata* has long petioles with wavy, waxy, coppery, olive-green leaves having silvery-green centre. *Begonia rex* 'Cleopatra' is a very attractive plant having light green leaves with chocolate red areas towards margin and produces clusters of shell-pink flowers. *Begonia* 'Braemar' has leggy plants with hairy stems, large pointed, dark clustrous green leaves, glossy red underside.

Brassaia actinophylla

FAMILY: Araliaceae

Brassaia actinophylla is an attractive foliage plant. It is tall, woody and branched with palmately lobed, soft, leathery leaves forming umbrella-like tops. Another variety *B. actinophylla* 'Compacta' is slow growing with broader, palmate leaves.

The plant requires warm, humid and semi-shaded conditions. It is useful for growing in large tubs or pots.

Caladium bicolor

FAMILY: Araceae

ORIGIN: South and Central America

Caladium bicolor bears fancy, long-stalked, arrow-head leaves which are gorgeously coloured with red, green, pink, crimson, rose, purple and white variegations in various attractive patterns. Many species of *Caladium* have marbled leaves and prominently coloured veins and margins or edges, while some have attractively translucent leaves. A few varieties having lance-shaped leaves have been reintroduced for cultivation. The plants are 45 to 60 cm tall. The bulbs of *Caladium* are planted singly, about 1 cm deep in 20 or 25 cm pots between March and May and kept moist and warm. In the beginning the plants are exposed to indirect light only. The plants need plenty of moisture and they love shade and respond quickly to the application of liquid manure once a week. After the rains, when the leaves begin to fade, water should be reduced gradually until the soil is dry. The bulbs should be stored in pots kept in the verandah. The bulbs can also be stored in dry sand in shallow boxes after drying them in shade for a few days. These may be repotted next spring.

Calathea zebrina

FAMILY: Marantaceae

ORIGIN: Brazil

Calathea is closely related to *Maranta* and is often listed by nurserymen under *Maranta* in their catalogues. *C. zebrina* is medium tall (30 cm or more) having long, lance-shaped, light green leaves with dark markings along the midrib and purple beneath. It loves shade and moist humid conditions. When placed in direct sunlight, the leaves become brown and curl up. The foliage should be sponged with tepid water once a week.

A dwarf and slow-growing species, *C. ornata* having dark purple foliage with fine pink lines along the centre vein is also grown for its very attractively marked foliage.

The species *C. makoyana*, a native of Brazil, called the Peacock Plant, produces ovate leaves having a feathery design on a translucent pale-green background, underside red. The other species, *C. insignis* is a very pretty plant with narrow, linear, stiff, waxy foliage having wavy margins; leaf yellow-green with lateral ovals alternately, large and small of darker green, underside maroon red.

Chlorophytum comosum variegatum

FAMILY: Liliaceae

ORIGIN: South Africa

It has a dense cluster of long, narrow, strap-shaped arching leaves which have creamy, yellow margin. In *C. comosum mediopictum* there is a cream stripe down the centre. The plant can be grown in a window in north or east or in any other situation. It needs plenty of moisture and responds to feeding with liquid manure. The plant forms young plantlets at the ends of long trailing stems which can be utilized for raising new plants. The variegated variety is more attractive and more commonly grown. The cultivar *C. comosum* 'Vittatum' produces clusters of rosettes of narrow linear leaves with wide, bright white central strip. The other cultivar *C. comosum* 'Milky Way' has very wide creamy central band with thin green margins.

Cissus discolor

FAMILY: Vitaceae

ORIGIN: Java

It is a beautiful trailing plant having long, narrow, ovate, drooping leaves with attractive marks of red, silver and metallic green along the midrib and crimson on lower side. The stem is pale red. It thrives best under warm, humid, moist and partially shaded conditions. Regular application of liquid manure is necessary for proper growth.

Cissus antarctica, the 'Kangaroo Vine,' is a native of Australia and is suitable for growing under cooler conditions. The leaves are smaller and dark green with serrated edges. Two other species, natives of Tropical America, *C. sicyoides* and *C. striata*, which have 5-fingered leaves, are also grown; *C. sicyoides* has larger leaves. *C. amazonica* is a hardy variety with green leaves striped grey.

Cissus rhombifolia, the 'Grape Ivy', has rambling stems and grape-like tendrils with compound leaves. The variety *C. rhombifolia* 'Mandaiana' having broad, leathery, recurved shining leaves is also attractive. The other variety is *C. rhombifolia* 'Ellen Danica' with deeply lobed leaflets. The species *C. rotundifolia* is a climbing plant with round, waxy and fleshy leaves having toothed margins.

Codiaeum variegatum* var. *pictum

FAMILY: Euphorbiaceae

ORIGIN: Southern India, Sri Lanka, Malaysia, Pacific Islands

Codiaeum or croton is a native of southern India and other tropical areas of the South-western Asia. It thrives exceedingly well in Bangalore, Mysore, Calcutta and other areas having mild and humid climate. In Punjab, Delhi and neighbouring areas having cool winter and warm and dry summer, crotons do not grow so well. The plant has a tall shrubby growth and grows well in pots. The leaves are gorgeously coloured with red, maroon, black, crimson, pink, orange, yellow, cream, green and various other hues and patterns. The leaf shape also varies considerably in different varieties. It may be long, narrow, curling or twisted like a cork screw, ribbon-like, laurel-shaped, broad, oak-shaped and oval and elongated with large variations in its size. For the full development of leaf colour, the plant must be placed in a sunny location. Hundreds of varieties are available now and many new ones are being added every year through selection from seedlings. With its wealth of varieties having richly and attractively coloured and intricately patterned leaves, croton is an unrivalled beauty among the foliage plants. It is an ideal plant for verandah and porch but does not last long when grown inside the room. However, for its unresistable beauty it is worth growing as a house-plant. Keep it in a sunny situation, give plenty of water and provide warmth during winter, particularly in northern India. It may not thrive well in the hills. Frequent sponging of leaves with water is beneficial. A nice collection of croton varieties is maintained by the Lalbagh Botanical Garden, Bangalore. A few outstanding exotic dwarf and compact varieties of croton are 'Excellent', 'Bravo', 'Iceton', 'Phillip Geduldig', 'Norma', 'Nervia' and 'Bangkok'.

Coleus blumei

FAMILY: Labiatae

ORIGIN: Java

Coleus is ideal for growing in pots and thrives well indoors in a sunny situation. The plants are 0.6 to 1 m tall and possess brilliantly coloured leaves having cut or serrated edges. In some varieties of *Coleus* the leaves are deeply scalloped, narrow and succulent with green margin and lavender veins which change from pink to red. The foliage colour may be green, dark green, yellowish green, bronze, crimson, scarlet, maroon, rose, pink, yellow, cream and white. The margins in many leaves are darker. The leaves may be uniformly coloured or blotched with streaks or splashes of contrasting colours. The size of the leaves in different varieties varies from 4 to 20 cm.

It is commonly propagated from seeds or terminal stem cuttings during the rainy season. The young seedlings or plants should be pinched back to make them bushy. The plant is susceptible to frost and grows best during rainy season or summer. It requires heavy watering and plenty of sunshine but not very bright sunlight. The colour of the leaves becomes bright in sunshine but fades in strong sunlight. In the shade the colour does not develop fully. It is susceptible to water-logging and therefore the soil must be well drained. Application of liquid manure once a week is useful. Replacing the top 2.5 cm of soil from the pots with well rotted cow-dung manure once or twice is beneficial to the plants. The inconspicuous bluish flower spikes should be removed regularly as soon as they start appearing to encourage better growth of the plant. After some time at the end of the season, particularly during winter, the plants become leggy and the leaves begin to fade. Such plants may be shifted to the verandah or under some shade where they may be maintained till the next season when they can be propagated by cuttings.

If crotons are propagated from seeds large variation in colour and size of leaves could be obtained. However, crotons may not set enough seeds in some places, and seedling plants grow slowly. Air layers could be taken from lanky plants to increase the number of plants. Such plants remain bushy in the initial years. After the air layers are separated, the mother plants develop new shoots from the bare stem and become bushy and comparatively more attractive. Stem cuttings could also be obtained from a few choicest cultivars and these are rooted in a good rooting media. Both air layers and cuttings are to be propagated during rainy season.

Codonanthe crassifolia

FAMILY: Gesneriaceae

ORIGIN: Brazil and West Indies

A creeping plant with small ovate, acuminate leaves, white flowers and red berries. Ideal for hanging baskets.

***Columnea microphylla*, 'Variegata'**

FAMILY: Gesneriaceae

A creeping plant with small, rounded and variegated leaves; flowers trumpet-shaped, orange and red. Suitable for hanging baskets.

Cordyline

FAMILY: Liliaceae

ORIGIN: California

The genus *Cordyline* is closely related to *Dracaena*. Its plants are upright and

dwarf. It has cream to bronze leaves splashed with white and shades of red or brown. The foliage varies in length and width. The most common species is *C. terminalis* which is a native of India, Malaysia and Polynesia. Its foliage has irregular patterns of pale, pink and green and bright red and green. The plants are dwarf. Its various attractive cultivars include 'Amabilis', 'Baby Doll', 'Big Doll', 'Margaret Storey', 'Mahatma', 'Bronze Beauty', 'Red Edge', 'White Edge', 'Norwoodensis', 'Negri' and 'Asahi'. The cultivar 'Mahatma' is very striking with its large lanceolate pointed leaves which are deep wine red, streaked crimson, had shades of glowing pink. Cordylines require humid conditions and bright light for their best growth and foliage colour.

Cryptanthus

FAMILY: Bromeliaceae

ORIGIN: Tropical America, Brazil

An important genus of Bromeliads. Plants dwarf, almost stemless more or less tufted, shaped like a starfish, slow growing with rosette of narrow, pointed leaves, finely serrated and lightly waved in some species, buff or pale cream with transverse stripes of reddish, green, buff and cream. The common species are *C. zonatus roseus* with finely serrated and fluted leaves having stripes, pale pink buff; *C. bivittatus* having narrow and pointed buff-coloured leaves with reddish stripes; and *C. tricolor* with pale cream leaves coloured pink at centre and edges, lightly marked green.

Ctenanthe

FAMILY: Marantaceae

ORIGIN: Brazil

Ctenanthe lubbersiana resembles *Maranta* and *Calathea*. It is a bushy and spreading plant with long narrow pale lime-green leaves having darker green irregular markings radiating from midrib. The other common species is *C. oppenheimiana* having very long, narrow, green leaves with heavy dark green markings from centre vein and dark green underside.

The variety *C. oppenheimiana tricolor* has long, narrow, pointed green leaves with dark green markings splashed with white and pink, and pink underside.

Cyperus alternifolius

FAMILY: Cyperaceae

ORIGIN: Madagascar

The plant has ribbon-like stems, atop of each of which there is a cluster of dark green, narrow, grass-like leaves arranged like umbrella spokes. It is

an evergreen plant which loves full sunlight, plenty of water and a rich soil. It can thrive well even under waterlogged conditions. The pots may be placed on pebbles in a saucer or shallow tray filled with little water. Frequent application of liquid manure is useful. Under dry conditions the tips of leaves become brown. It is also suitable for growing in dishes and troughs. The dwarf varieties, *gracilis* and *nanas* are ideal house-plants. There is also a variegated variety 'Variegatus', having white stripes on the leaves. It should be grown in full sunlight and fed with liquid manure, otherwise it will lose its variegated colour.

***Dianella* sp. 'Variegata'**

FAMILY: Liliaceae

ORIGIN: Tasmania

Plants with two rows of grass-like, rough-edged variegated leaves striped yellow.

Dieffenbachia

FAMILY: Araceae

ORIGIN: Central and South America

Dieffenbachia is commonly known as the Dumb Cane because of its leaves and stems, which are poisonous when eaten or chewed, cause temporary dumbness. The most commonly grown species is *D. maculata* (*D. picta*) which is a native of Brazil. The plant is tall with thick stem and lance-shaped, dark green, broad leaves having irregular cream or white spots or markings in the centre. It needs moderate light but not direct sunshine. The plant does not like waterlogging, but requires medium moist conditions. When the plants grows old it becomes lanky, i.e., the bottom leaves fall off. Such plants can be air layered to raise young and well-shaped plants. Otherwise, nodal cuttings are obtained with 2-3 nodes and placed in a rooting media horizontally. New plants will grow from the nodes.

Some of the popular varieties are 'Rudolph Roehrs' with oblong, pointed, light yellow leaves having ivory white blotches, midribs and margins green; 'Picta' having yellow lamina and green spots; and *D. maculata jenmannii* with glossy green, oblong leaves having ivory-coloured, feather-like bars.

Another species is *D. amoena* which is taller and tougher species than the others with large, oblong, pointed leaves having deep green and white variegation along the veins. Its variety 'Tropic Snow' is a very compact plant with leathery, glossy, deep green leaves having rich variegation with cream and white green centre.

Dieffenbachia 'Exotica' has small, ovate, pointed leaves variegated cream



Rex Begonia—This is a rhizomatous *Begonia* prized for its foliage. Its leaves are fan-shaped and lop-sided, hairy with toothed edges and silvery white or deep crimson with attractive and intricate patterns.



Cordyline—The plants are upright and dwarf. They have cream to bronze leaves splashed with white and shades of red or brown. Cordylines require humid conditions and bright light for their best growth and foliage colour.

white along the veins. Other attractive cultivars are *Dieffenbachia* 'Exotica Perfection' with small, broadly bordered, deep green leaves and greenish ivory variegation: *Dieffenbachia* 'Marianna' having creamish leaves with dark green border; and *Dieffenbachia* 'Veerle' like *Dieffenbachia* 'Exotica Perfection' but with richer cream-white variegation.

Dizygotheca elegantissima

FAMILY: Araliaceae

ORIGIN: New Hebrides

The plant is tall and erect with a single thin stem having finely divided and ribbed leaves with prominent midrib, palmately arranged, borne on long thin stalks. The leaves broaden with age. The stem and leaves are dark copper in colour with green veins. It may be grown in partial shade, if required. The plant needs warm, moist conditions and responds well to applications of liquid manure.

The cultivar *D. elegantissima* 'Castor' is compact growing with palmately compound purplish green leaves.

Dracaena

FAMILY: Liliaceae

Of the several ornamental dracaenas, the following three species are popular: *D. fragrans* (Corn plant), *D. godseffiana* (Gold-dust) and *D. sanderiana* (Variegated Dragon Tree). The tall species *D. fragrans*, a native of Guinea, has long and broad, arching, dark green glossy leaves. Unlike the other species, *D. godseffiana*, a native of Congo, has small, yellow, dotted, glossy green leaves on a dwarf and branching plant with wiry stems. *D. sanderiana*, also from Congo, has long narrow leaves having two white bands bordering a grey-green stripe down the centre. The variegation in all cases fades with age.

There are some popular *Dracaena* varieties, *D. fragrans* 'Victoria' has pendant, broad, soft leathery green leaves with silver grey at centre and broad margins of golden yellow or cream. In the variety *D. fragrans* 'Lindenii' leaves have broad gold margins with a narrow, green and gold centre, while the leaves of *D. fragrans* 'Massangeana' have broad green margins with gold centre. Another attractive variety is *D. godseffiana* 'Florida Beauty', which is branching shrub with thin stems and 2-3 whorls of thick leathery leaves having cream-white blotches. The new sport *D. godseffiana* 'Friedmanii' has a wide, white central band. There are two popular varieties of *D. deremensis*, namely, 'Warneckii' having long, sword-like, broad leaves with glossy dark green margins and two longitudinal white strips bordering the milky-green central band; and 'Bausei' with dark green leaf margin and a white centre. There are

compact forms of 'Bausei' and 'Warneckii' also.

Dracaena marginata 'Tricolor' has a rosette of long, thick, fleshy, narrow tricolour (green, yellow, red) leaves. Its another colourful variety is *D. marginata* 'Colorama' with bright, glossy rose and fuchsia stripes.

The dracaenas can be grown in partial shade or full sunshine. They require moist soil. In dry conditions or in bright sun the tips of leaves get scorched and become brown. When the plant becomes old it drops off lower leaves and becomes leggy. Such plants may be air-layered to raise new plants.

Episcia cupreata

FAMILY: Gesneriaceae

ORIGIN: Tropical America

Episcia, called Flame Violet, is a semi-trailing plant having decorative foliage and coloured flowers, suitable for hanging baskets. It grows well in indirect sunlight and warm temperatures. The most attractive varieties are 'Acajour' with silvery leaves having dark brown markings and orange-red flowers; 'Chocolate Solider' having chocolate coloured foliage and red flowers; 'Moss Agate' with puckered-green leaves and crimson flowers; and 'Pink Brocade', a very spreading plant with leaves having dark pink margins and silver-grey centre.

***Fatshedera lizei* (*Fatsia japonica* × *Hedera helix*)**

FAMILY: Araliaceae

It is a hybrid from a cross between two genera, *Fatsia* and *Hedera* (Ivy) evolved by a French nurseryman. It is a tall plant having dark green, 5-lobed leaves like those of the castor plant. It needs cool, moist and partially shaded conditions. There is a variegated variety also. In India, it can be recommended for growing in the hills or in areas having mild climate.

Fatsia papyrifera (syn. *F. papyrifera*), the Rice Paper Plant, from China, closely resembles castor plant with large, green, glossy, palmate leaves which are heavily fingered and ribbed. It is also a useful house-plant.

Ficus

FAMILY: Moraceae

The three important *Ficus* species are *F. elastica decora*— the Indian Rubber Plant, *F. lyrata* (*F. pandurata*),—the Fiddle-leaf Fig. and *F. pumila*— the Creeping Fig.

The Indian Rubber Plant, *F. elastica decora* is a native of Indonesia and has

big dark-green leathery leaves with bright red growing tip from where the new leaves unfold. There is also a variegated variety which is very attractive. *F. lyrata* has very large and tough, fiddle-like, glossy-green leaves with prominent veins. The Creeping Fig, *F. pumila* (*F. repens*), a native of China and Japan, is an excellent trailing plant ideal for growing on trellis or wall. It has numerous small, heart-shaped, green leaves. A variegated variety is also available.

The figs should be grown in full sunlight or partial shade. They require moist soil and humid conditions but do not like overwatering and waterlogging. They respond well to application of liquid manure. The leaves of the Rubber Plant should be frequently sponged with water. The old Indian Rubber Plant and the Fiddle-leaf Fig when become leggy should be replaced with new ones raised from stem cutting or air-layering.

There are several beautiful varieties of *Ficus elastica*, such as 'Rubra'— young leaves maroon red and older leaves short, pointed, oval with red midrib; 'Decora', large broad, deep glossy-green leaves with ivory midrib and red growing tip; 'Decora Rubra' or 'Black Prince', dark green, glossy, thick leaves with red growing tip; 'Decora Schrijvereana', broad, glossy, deep green leaves irregularly variegated grey green in the middle and light green or cream and light yellow towards the margin with cream-coloured midrib and red petiole; 'Robusta', large and stout plants with almost round decora-like leaves; 'Belgica', deep, waxy green corrugated leaves with pink or cream-coloured midrib; 'Doescheri', coloured leaves varying from green with grey to white and cream yellow, leaf stalk and midrib pink; 'Hondurus', large, broad, thick, leathery leaves with mottled variegation; 'Variegata', broad leathery leaves, variegated grey edged with cream yellow; and 'Zulushield', large, broad, thick, leathery leaves with creamish-white variegation.

There is another attractive species, *F. benjamina*, a dense-growing, very compact, bushy plant with drooping branches; leaves slender, pointed, long, ovate, shiny deep green. Its varieties are 'Nuda' which has small, glossy, narrow and pointed leaves; 'Variegata', a small bushy plant with small, elliptical, glossy, light green leaves which are margined and variegated with ivory white; and 'Albo-marginata' having leaves thinly bordered with cream variegation.

A few other common species include *F. cyathistipula*, a bushy plant with long, oblanceolate, leathery, dark green leaves; *F. macrophylla* having thick, leathery, broad, oblong leaves; *F. retusa* (syn. *F. nitida*), a tall plant with long, small, elliptical, leathery, smooth, waxy, dark green leaves; *F. panduriformis*, a dwarf plant having leathery, glossy, elliptical, dark green leaves with ivory midrib and lateral veins; *F. roxburghii* (*auriculata*) having large almost round leaves; and *F. triangularis*, a dwarf plant with triangular-shaped, dark green leaves. In the variety *F. triangularis* 'Variegata' the foliage being variegated creamish yellow. The two of its attractive and popular varieties are *Ficus* 'Panda' and *Ficus* 'Westland'. *Ficus* 'Panda' with thick, leathery, ovate, dark green leaves; young leaves develop creamish yellow colour if kept under the sun. The other *Ficus* 'Westland' resembles *F. benjamina* 'Nuda' but its leaves have creamish yellow variegation when grown under good light.

Fittonia argyroneura

FAMILY: Acanthaceae

ORIGIN: Peru

It is a dwarf, prostrate-growing plant having roundish green leaves with a beautiful pattern of silvery veins resembling a snake's skin. The plant thrives best in shade and warm and humid conditions. Its growth is best during the rainy season. It is ideal for growing in terrariums, bottle gardens and hanging baskets. Another species *F. verschaffeltii* having dark green leaves with deep red veins is also grown as a house-plant.

Grevillea robusta

FAMILY: Proteaceae

ORIGIN: Australia (New South Wales)

The young plants of *Grevillea robusta* are grown as house-plants for their beautiful, finely-cut, fern-like foliage having silvery hue. The plant is tall and graceful. It requires partial shade or full sunshine and moist well-drained soil. The plant should be replaced with a new one when it grows very tall.

Gynura sarmentosa

FAMILY: Compositae (Asteraceae)

A fast-growing, velvety vine with violet or purple hairs on stem and leaves. An attractive small house-plant.

Hedera

FAMILY: Araliaceae

ORIGIN: England, Europe, Asia and North Africa

The two popular species are *Hedera helix* and *H. canariensis*. They are natives of England, Europe, Asia and North Africa. Both green leaved and variegated Ivies are grown as trailing plants for their attractive lobed foliage. Each species has several varieties, viz. 'Cristata', 'Curlilocks', 'Glacier', 'Fantasia', 'Goldheart', 'Harold', 'Little Diamond', 'Jubilee', 'Lutzii', 'Ravenholst', 'Nielson', 'Marmorata', 'Pittsburgh', 'Variegata' and 'Sagittaeifolia' of *H. helix*; and 'Folis Variegatis', 'Golden Leaf', 'Variegata' and 'Maculata' of *H. canariensis*.

The Ivies require cool climate and therefore grow best in the hills. They perform well in the mild climate of Bangalore. They are excellent plants for

trailing on wall, trellis or screen. The plants should be grown in full sunlight and watered lightly, especially during winter. Liquid manure may be applied to encourage good growth. The leaves should be occasionally sponged with water.

Helxine soleirolii

FAMILY: Urificaceae

It is popularly known as Baby's Tears. The plants are creeping in habit with small, round, dark green leaves, forming moss-like mass and suitable for hanging baskets. It remains hugging the surface of the containers. Most attractive but susceptible to waterlogging.

Hoya

FAMILY: Asclepiadaceae

The most commonly grown species is *Hoya carnos*a, which is a trailing plant. Its leaves and flowers are waxy. The popular varieties are 'Compacta', a compact plant with cupped, thick green leaves; 'Compacta Regalis', leaves bordered with ivory to rosy margins; 'Exotica', leaves in two shades of green, centre variegated, yellow and pinkish cream, flowers pinkish white; 'Silver Pink', silver blotching on waxy green leaves, petioles red; and 'Variegata', green or bluish green leaves with pink and cream and white broad edges.

Another species, *H. bella*, is a dwarf shrub with drooping branches, deep-green, thick leaves having a brown band at the midrib; flowers waxy, white with a purple centre.

Hypocyrta glabra

FAMILY: Gesneriaceae

Plants dwarf having ovate leaves and orange-coloured flowers in leaf axils.

Leea coccinea

FAMILY: Vitaceae

A shrub with long 3-pinnate, glossy-green leaflets having waxy margins. An attractive house-plant.

***Manihot esculenta* (syn. *M. utilissima variegata*)**

FAMILY: Euphorbiaceae

ORIGIN: South America

The roots are thick and fleshy. The plants are about 1-m tall with variegated, pale yellow and green leaves which are 5- or 7-parted and smooth.

The plant requires a moist and well-drained soil. It can be grown under shade but the variegation of the foliage develops better under sunlight. It is ideal for growing in pots, and grouping them as well as for a colourful mass effect. It has a long period of rest and remains leafless throughout winter. But in places where winter is not severe, leaves may not drop.

Maranta leuconeura* var. *Kerchoveana

FAMILY: Marantaceae

ORIGIN: Brazil

This is one of the most popular marantas grown as house-plants. The leaves are oval, round, pale green with dark-brown or chocolate markings along the central vein. In the younger leaves the markings are purple or maroon-red. The other common variety, *M. leuconeura* var. *massangeana* (Fishbone Maranta), is also a prostrate type with oval-rounded, olive-green leaves having prominent white veins. A dwarf species, *M. makoyana* having almost transparent and very pale pink leaves with dark brown markings is also grown, but is not so hardy as the other species. Besides these, there are quite a number of other varieties, both tall and dwarf. The other important species is *M. bicolor* with dark-green foliage having light-green blotches on the upper surface and purple beneath.

The marantas like warm, humid and moist conditions. They grow best in partial shade and rich soil. The leaves of marantas close at night and are therefore known as the Prayer Plants.

***Monstera deliciosa* (syn. *Philodendron pertusum*)**

FAMILY: Araceae

ORIGIN: Mexico

It is a handsome, tall, erect or trailing plant with very large, broad, elongated, heart-shaped, cut and slashed, medium-green glossy leaves perforated with large holes, along either side of the midrib, particularly in young leaves. The variety 'Variegata' has creamish white variegation on leaves. The plant requires partial shade, plenty of water and well-drained soil. Liquid manure may be given during the rainy season to encourage good growth. The leaves should be occasionally sponged with water to improve their glossiness.

It is an ideal climbing plant for trailing on moss sticks. There is a green and white variegated variety also.

A dwarf variety, 'Borsigiana' from Mexico, with a less vigorous habit, is suitable for growing in smaller rooms. The species *M. pertusa* is a climber having smooth perforated leaves. Another climbing species, *M. obliqua expiliata* produces very big elliptical leaves having ovate-shaped perforations in double rows.

Pandanus veitchii

FAMILY: Pandanaceae

ORIGIN: Polynesia

The leaves of this plant are long, sword-shaped, arching and striped white and green with spines along the margin. The plant thrives best in semi-shade, humid and moist conditions.

P. sanderi and *P. baptistii* are other species well suited for pot culture. The other attractive species and *P. sanderi* 'Roehrsianus' having long leaves with longitudinal stripes and bands of light and golden yellow and spiny margin; *P. veitchii* with a rosette of long tapering dark green leaves having broad creamy white margin; and *P. baptistii* with spirally arranged, arching and tapering leaves, blue-green with many yellow stripes in the centre.

Peperomia

FAMILY: Piperaceae

Peperomia has fleshy stems and leaves. The foliage has attractive markings, colours and shapes. The plants also produce white or green curved or straight flower spikes above the foliage. Of the several species grown, the important ones are *P. argyreia* (syn. *P. sandersii*), the Watermelon Begonia, a native of Brazil; *P. magnoliaefolia*, the Desert Privet, from the West Indies; and *P. obtusifolia*. In *P. argyreia* the foliage is rounded, heart-shaped and silvery with dark green markings radiating from the base. The foliage is dark, shiny, olive-green in *P. magnoliaefolia* and also variegated cream and green in the variety *P. magnoliaefolia variegata* and dark purple with green hue in *P. obtusifolia*. *P. argyreia*, *P. obtusifolia* (*P. clusiaefolia*) and *P. magnoliaefolia* grow well in the plains.

The attractive species include *P. verschaffeltii* with oval, heart-shaped, bluish-green leaves having broad silver bands; *P. polybotrya*, glossy, waxy-green shield-like leaves with purple edges and grey green beneath; *P. sandersii*, deep green with silver bands radiating from centre; *P. obtusifolia*, succulent stem striped brown with waxy-green fleshy leaves; *P. obtusifolia* 'Variegata' leaves waxy, round or elliptic, broad variegation of creamy white; *P. obtusifolia*, 'Gold Tip', deep green leaves variegated and marbled creamy yellow near the tip; *P. scandens* 'Variegata', small cordate leaves, light green with irregular creamy-white

border; *P. scandens*, a creeper with green, waxy, small, heart-shaped leaves; *P. clusiaefolia*, thick, fleshy, narrow, obovate leaves, metallic olive-green with broad red-purple margin; *P. clusiaefolia* 'Variegata', elongated fleshy, pale-green leaves variegated with creamy-yellow inward from the margin; *P. grisso-argentea* 'Nigra', glossy-black, olive-green, cupped leaves in compact rosette, pale-grey reverse; *P. grisso-argentea*, shield-like thin leaves painted glossy silver; *P. glabella* 'Variegata', elliptic, small leaves, light green with creamy-white variegation; *P. elongata*, glossy green, large, fleshy leaves; *P. cubensis*, soft, waxy green, broad leaves; *P. cubensis* 'Variegata' milky-green leaves margined and variegated creamy white.

Warm and moist conditions, well-drained soil and shaded or partially shaded situations are best for the growth of *Peperomia*. Feeding with liquid manure during the rainy season is beneficial to the plant.

A few other species are: *P. angulata* having deep-green leaves with yellowish parallel veins; *P. bicolor* with velvety olive to grey metal green leaves having broad silver band at the centre and parallel stripes; *P. caperata* with deeply corrugated, waxy, green leaves with chocolate and reddish variegation; *P. hoffmanii*, leaves waxy and dull olive green; *P. orba*, leaves waxy, light green; *P. orba* 'Green Gold', leaves pale green with irregular cream variegation; *P. pereskifolia*, having creeping red stems, small, waxy, olive-green leaves in whorls; and *Peperomia* 'Tricolour' with obovate leaves, variegated reddish cream.

Philodendron

FAMILY: Araceae

ORIGIN: Central and South America

Several ornamental species of this genus are grown as house-plants. The Finger Plant, *P. bipinnatifidum* (*P. dubia*), is a commonly grown species having large, blue-green, glossy, heavily indented or fern-like leaves. The other species with almost similar foliage are *P. elegans* (with very deeply divided leaves), *P. selloum*, *P. lacinosum* and *P. laciniatum*. The species *P. selloum* with big, dark green bipinnate leaves with short lobe at tip is a hardy plant for growing indoor. There are others like *P. hastatum*, *P. mandaianum*, *P. erubescens* (suffused reddish), *P. sodiroi* (mottled light grey), *P. bipennifolium* and *P. ilsemannii* (dark green mottled cream with red veins) which have shield-shaped foliage. In *P. panduraeforme* and *P. fenzlii* the leaves are 3-lobed and glossy; *P. porrduraeforme* is ideal for growing on a moss stick as it is quick growing. The best trailing *Philodendron* is *P. scandens*, a very heavily-leafed vine with dark and glistening, elongated, heart-shaped leaves. Sometimes it is also referred to as *P. cordatum*, which actually is a synonym of *P. oxycardium* having similar leaves.

A few other ornamental species are *P. deflexum*, a creeper with leathery, 3-lobed waxy, dark green leaves; *P. florida*, soft, leathery, dark green, 5-lobed leaves with pale midrib and brown-red beneath; *P. microstictum*, a slow-growing



Dieffenbachia—Commonly known as Dumb Cane because of its leaves and stems, which are poisonous when eaten or chewed and cause temporary dumbness.



Maranta—The marantas like warm, humid moist conditions. They grow best in partial shade and rich soil. The leaves of marantas close at night and are therefore known as the Prayer Plants.

climber with broad, heart-shaped thick, glossy green leaves; *P. oxycardium* (*P. cordatum*), broad, cordate leaves on long stems; and *P. leichtlinii*, ovate leaves with unusually large, oval holes in the leaves, evenly down each side of the midrib. There are several *Philodendron* hybrids having very attractive foliage, like 'Royal King', 'Red Duchess', 'Red Princess', 'Emerald Duke', 'King of Spades', 'Florida', 'Majesty', 'Royal Queen', 'Emerald King' and 'Painted Lady'.

Philodendron grows best in partial shade or shade and moist conditions. They should be kept away from droughts. Since they have aerial roots, it is useful to grow them on a moss stick which can be kept moist to provide a support to the aerial roots. The plants should be grown in large pots and tubs. They require moderate watering and well-drained soil. Liquid manure should be used occasionally and the leaves sponged with water regularly.

***Pilea microphylla* (syn. *P. muscosa*)**

FAMILY: Urticaceae

ORIGIN: Peru, Tropical America

This is popularly known as the Artillery Plant, because its anthers suddenly burst and sharply discharge their pollen. It is a dwarf trailing plant having small leaves with attractive markings. Another common species is *P. cadierei*, the Aluminium Plant or the Friendship Plant with small, dark-green, glossy, oval leaves with bright silvery, elongated markings. A dwarfer variety, *P. cadierei nana*, is also available.

The other important species are *P. involucrata*, with dark green leaves turning to coppery-brown when exposed and red beneath, covered with hairs; *P. nummularifolia*, a low creeping plant with small, circular leaves, corrugated, hairy, light green, paler beneath, small flowers in clusters; *Pilea* 'Silver Tree', leaves bronzy green with silver band in the centre and silver dots on the sides; and *P. repens* 'Moon Valley', low spreading with thin, round, glossy, coppery-brown leaves.

Pilea is an ideal plant for edging and for growing in terrarium, bottle-gardens and dish-gardens, and for grouping with tall plants under the shade and moist conditions in which it thrives best. It needs shaded or partially shaded situations and plenty of water. Under dry conditions the plant drops off its leaves. It should be regularly fed with liquid manure to encourage good growth.

Pleomele

FAMILY: Liliaceae

Pleomele is closely related to *Dracaena*. The species *P. angustifolia honoriae* has scandent stems with many clasping, flexible, long, glossy and leathery-strap

leaves bordered waxy ivory yellow or cream. The other common species is *P. reflexa* having a rosette of short and narrow leathery-strap leaves, slow-growing and its popular cultivar is *P. reflexa* 'Song of India', which is similar to *P. reflexa* but margined by two side bands of golden yellow or cream. The cultivar *P. reflexa* 'Mediopicta' is also similar to *P. reflexa* but the leaves have faint, pale variegation in the centre.

Pleomele is grown in the same way as *Dracaena*.

Polyscias

FAMILY: Araliaceae

The plants are bushy shrub with attractive foliage. The common species, *P. balfouriana* has three orbicular leathery leaves. Its popular cultivars are *P. balfouriana* 'Blackie' having pinnate leaves with glossy, blackish-green leaflets with softly serrated margins; *P. balfouriana* 'Marginata' with 3 orbicular, coarsely toothed leaflets having irregular white border; and *P. balfouriana* 'Pennockii' having leathery, cordate leaves, variegated with tinted creamy-white to pale-green, irregularly dark green towards the edges. Three other species are *P. filicifolia*, leathery, fern-like, dark green leaves with purple midrib; *P. guilfoylei* 'Victoriae', bipinnate, lacy, greyish green leaves, small, pendant segments, toothed and bordered white; and *P. paniculata* 'Variegata', a willowy shrub with pinnate leaves, leaflets deep green, splashed with cream and greenish white, glossy on both sides.

Rhoeo discolor

FAMILY: Commelinaceae

ORIGIN: Central America

The plant has a short, thick, fleshy stem bearing a rosette of leaves which are smooth, long, narrow, pointed with olive or cream and green stripes above and purple beneath. It produces small, white, boat-like flowers in the axils of the leaves. The other attractive species is *R. spathacea* 'Vittata', with stiff leaves and spreading habit; leaves metallic, dark green with red tinted, pale yellow longitudinal stripes; undersurface glossy purple.

It requires full sunlight and warm and moist conditions for its best growth.

Ruellia devosiana

FAMILY: Acanthaceae

A small shrub with creeping habit. Stem purple; leaves oval, lanceolate,

toothed, deep green with prominent white midrib and veins, purple beneath; flowers tubular whitish lilac. Suitable for hanging baskets.

Sansevieria

FAMILY: Liliaceae

ORIGIN: Congo

This is the most popular house-plant. The most common species is *S. trifasciata* 'Laurentii', thick and fleshy leaves emerge erect from the ground and are sword-shaped with dark green and grey-green, irregular horizontal bands and yellow margin in the leaves. A few other not-so-common species are: *S. liberica* with broad white bands; *S. parva*, a dwarf plant with narrow curved leaves; *S. cylindrica* with tube-like leaves; and *S. trifasciata* 'Hahnii', another slow-growing plant with two broad pale-green bands running along the length of each leaf. In *S. trifasciata* 'Golden Hahnii', the bands are golden coloured while in *Sansevieria* 'Silver Hahnii', the bands are silver white. The species *S. thyrsiflora* (syn. *S. guineensis*) 'Marginata' has broad leaves with wide yellow bands along the margin. There are several other species which can also be grown successfully in pots.

Sansevieria needs very little water and can grow even in a dark corner of the room. It thrives exceedingly well under the least favourable conditions even without much care and attention. Thickly growing old plants may be divided when necessary. Leaf cuttings are also used for propagation but the plant *S. trifasciata* 'Laurentii Compacta' with short leaves and yellow margin reverts to the mother plant *S. trifasciata* and loses its variegation or yellow margin. It is therefore best to multiply from rhizomatous roots by division. It should not be grown grouped with other plants which may need more water. *Sansevieria* is the best dependable house-plant.

Schefflera

FAMILY: Araliaceae

ORIGIN: Tropics

Schefflera arboricola is an upright plant with thick stem, spreading 7-or 8-lobed, medium green leaves borne on long, wiry stalks alternately from the main stem.

It is a hardy plant which grows well in partially shaded places. There are variegated varieties also like *S. arboricola* 'Green Gold', with golden yellow variegation; and *S. arboricola* 'Henriette' having pale yellow variegation.

Scindapsus aureus

FAMILY: Araceae

ORIGIN: Solomon Islands

A popular house-plant, it is commonly known as Pothos or Money Plant. It has a trailing habit with small, heart-shaped, light green leaves marbled or flecked with yellow. The stems are thin and fleshy and produce aerial roots. The variety 'Marble Queen' with dark green foliage heavily marbled with white or cream is well known. *S. pictus* var. *argyraeus*, another small species and a native of East Indies, is also grown as a house-plant; it has medium-sized, heart-shaped, bluish-green leaves that are mottled and have silvery margin.

It is an ideal plant for growing on a moss-stick and for drooping or trailing in planters, hanging baskets or wall-brackets. It can also be used as a climber for framing the windows or doors. Allowed to grow up a tree, the stem thickens and the leaves become as large as those of *Monstera*. The plant grows well in semi-shade, warm, moist and humid conditions. For a proper development of variegation in leaves, the plant needs more sunlight. It is a dependable and attractive house-plant.

Selaginella

FAMILY: Selaginellaceae

ORIGIN: Mostly from Tropical America

The selaginellas are related to the ferns but closely resemble the moss. The plant has tiny, scale-like, green leaves and forms a carpet or ball of emerald green. The commonly grown species are *S. kraussiana*, *S. uncinata*, *S. lepidota*, *S. apoda* (syn. *S. apus*) and *S. emmiliania*.

They grow under varied conditions and can be grown singly in small pots or grouped in dishes and troughs. They like humid and moist conditions and do not grow well under hot and dry conditions. In India, they grow well in a conservatory.

Senecio

FAMILY: Compositae

The species *Senecio cineraria* is a white, woody, perennial having thick, deeply cut pinnate leaves of ash colour.

S. radicans 'Fish Hook' is a creeper with smooth, short, dark green leaves, tapering at both ends and leaf tips bend upwards resembling a fish-hook. Suitable for hanging baskets.

Setcreasia purpurea

FAMILY: Commelinaceae

ORIGIN: Mexico

The plant has thick and fleshy stem with a tendency to trail and long, narrow and slightly transparent, pale purple leaves. It is an attractive plant. Another species, *S. striata*, with cream and green variegated foliage is also grown.

It can be grown in partial shade. It thrives well in cool, moist conditions and well-drained soil. It loses its purple colour when grown in insufficient light.

Spathiphyllum

FAMILY: Araceae

ORIGIN: Tropical America, Malaysia

Spathiphyllum wallisii is commonly known as Peace Lily. Its pure white, arum-shaped flowers emerge from a background of highly glossed dark green, long, narrow leaves with veins having ribbed effect on the leaf surface. *Spathiphyllum* sp. 'Mauna Loa' has dark green, lanceolate, glossy leaves with pure white, large, long-lasting spathes.

It requires warm and humid conditions and partial shade. The plants should be watered regularly in summer and only moderately in winter.

Strobilanthes dyerianus

FAMILY: Acanthaceae

ORIGIN: South-East Asia, Penang

The leaves are ovate, satiny, dark green with rich rosy-purple variegation. The undersurface of the leaf is vine purple. The colour of the foliage is best in young plants.

The plant thrives well in a moist, light and well-drained soil, and warm and humid conditions. It can be grown in partial shade.

Syngonium podophyllum

FAMILY: Araceae

ORIGIN: Central and South America

This is a trailing plant with rough, triangular-shaped, bright emerald-green leaves with extended base. The plant forms aerial roots. There is also a variegated variety with white and green variegation. *S. podophyllum* 'Albo-virens' has leaves shaded, ivory to greenish white with green margin. The cultivar

S. podophyllum 'Butterfly' is slow-growing, compact plant with broad butterfly-like, silver-white leaves. The slow-growing creeper *S. podophyllum* 'Emerald Gem' has arrow-shaped, dark green leaves with white, irregular variegation.

It is a good climbing plant for growing on a moss-stick. The plant likes semi-shaded, moist and humid conditions.

Tradescantia fluminensis

FAMILY: Commelinaceae

ORIGIN: Argentina and Brazil

With its trailing habit and small, glossy-green leaves, it is a beautiful house-plant. The variegated varieties 'Aurea' and 'Variegata' have white and yellow and silvery stripes, respectively, on their pale green leaves.

The other commonly grown species are *T. purpurea* with rich dark, purple leaves and small, pink flowers in summer; and *T. reginae* with long, slender, silvery-green leaves having middle vein margined dark green and purple underneath. The species *T. purpurea* is also known as *Zebrina purpurii*. The small-leaved *Tradescantia* species are *T. fluminensis* (syn. *T. albiflora*) with small, glossy, dark green leaves having red underneath, borne on shiny red stems; *T. albiflora* 'Quick Silver' has white-striped leaves; *T. albiflora tricolor*, similar to *T. albiflora* but dark-green leaves striped cream and pink; and *T. blossfeldiana* with glossy dark-green purple underside and fine hairs and clusters of pink flowers.

It is a useful plant for drooping in planters, dishes and troughs as well as in terrariums, bottle-gardens and hanging baskets. It also makes a nice table-decoration. The plant can grow in semi-shade. For best growth it requires a moist condition.

Zebrina pendula

FAMILY: Commelinaceae

ORIGIN: Mexico

This plant closely resembles *Tradescantia*. It is also a trailing plant. The leaves are paired, about 2-5 cm long and are glistening silvery-grey-green with broad, purple or mauve stripes down the centre. The underside of the leaf is dark mauve. It produces mauve flowers. A better species is *Zebrina pendula* var. 'Quadricolor' with irregular stripings of silvery-pink, cream, dark-green, red or rosy purple and silvery grey. Another common species is *Z. purpurii* having medium-sized, bright dark, purple or pink leaves with small pink flowers.

It is used in the same way as *Tradescantia* and also requires the same treatment for growing as given to *Tradescantia*. It is one of the best dependable trailing plants.

FERNS (POLYPODIACEAE)

The ferns, that are native to tropical regions, are ideal house-plants because they can be grown under shaded or semi-shaded situations. Many species are native to this country. They do not require much attention or care except occasional division and feeding. The brown or dry fronds should be frequently removed. Water them frequently and keep them moist. Under excessively dry conditions the fronds become brown.

Generally, ferns are grown in medium-sized (15-22 cm) pots. The planting medium contains one part coarse sand, two parts leaf-mould, one part soil, one part small pieces of charcoal, one part crushed lime mortar and few small pieces of broken brick. During winter, protect the plants from cold injury by keeping them in a verandah or in a sheltered area. Similarly in summer, place the plants under the shade of a tree or in a shaded situation.

Of the several kinds of ferns those commonly grown are the Black Maidenhair Fern, *Adiantum capillus-veneris*, *A. peruvianum*, *A. tenerum*, *A. caudatum*, *A. cuneatum*, the Bird's Nest Fern, *Asplenium nidus*, the Silver Fern, *Cheilanthes argentea*, the Squirrel's Foot Fern or Ball Fern, *Davallia bullata*, the Boston Fern, *Nephrolepis exaltata* var. *bostoniensis* (also *N. cordifolia* and *N. duofi*), Hares-foot Fern, *Polypodium aureum* and the Brake Fern, *Pteris cretica*. The other important ferns are the Royal Fern, *Osmunda regalis*, *Blechnum spicant* (*B. boreale*), *B. occidentale*, *Crytomium falcatum*, *Dryopteris* spp., *Polypodium vulgare*, *P. nigrescens*, *P. wallichianum*, *Pteris biaurita argyraea*, *P. biaurita quadriaurita*, *P. multifida* (*P. sessula*), *Lygodium circinatum* and *L. scandens*. The species *Adiantum caudatum*, *Blechnum spicant*, *Davallia solida fijiensis* and *Lygodium scandens* are suitable for hanging baskets. The Staghorn Fern (*Platycerium grande*, *P. bifurcatum* and *P. wallichii*), an epiphyte, grows well at Bangalore and other cool areas. The fern species suitable for growing in the plains are the Black Maidenhair Fern, *Adiantum capillus-veneris*, *A. peruvianum*, *A. ciliatum* (*A. caudatum*), *A. cuneatum*, *A. tenerum*, the Bird's Nest Fern, *Asplenium nidus*, *Blechnum occidentale*, *B. spidant*, the Silver Fern, *Cheilanthes argentea*, the Boston Fern, *Nephrolepis exaltata* var. *bostoniensis*, the Squirrel's Foot Fern or Ball Fern, *Davallia bullata*, the Royal Fern, *Osmunda regalis*, the Hares-Foot Fern, *Polypodium aureum* and the Brake Fern *Pteris cretica*. The Staghorn Fern (*Platycerium grande*, *P. bifurcatum* and *P. wallichii*) is a very attractive fern which is grown best on trees or wood pieces and requires warm and humid climate.

PALMS (PALMACEAE)

Palms are best suited for growing in large halls or rooms. Single plants grown in large tubs or pots are ideal for keeping on the floor. They require semi-shaded, moist and warm conditions. The soil must be well drained. Occasional feeding with liquid manure is beneficial to the plant. The leaves should be sponged and sprayed with water to prevent them from drying. The

plants should be kept away from droughts to avoid injury to the foliage.

The important palms grown as house-plants are the Cocos Palm, *Syagrus weddellii* (*Cocos weddelliana*), the Kentia Palm *Howea forsteriana* and *H. belmoreana* (dwarfer species), *Actinophloeus macarthurii* (*Ptychosperma macarthurii*), *Chrysalidocarpus lutescens* (Areca Palm), *Neanthe bella* (dwarf), the Pygmy Date Palm *Phoenix roebelenii* and *P. rupicola*. They all have feathered or pinnate leaves. Among the fan-leaved the useful species are *Chamaerops humilis*, *Rhapis excelsa*, *Thrinax argentea*, *T. parviflora*, *Licuala gracilis*, *L. grandis*, *L. elegans*, *Livistona chinensis* and *L. rotundifolia*. The hardy palms are *Actinophloeus macarthurii*, *Phoenix rupicola*, *Rhapis excelsa*, *Thrinax argentea*, *Livistona chinensis* and *L. rotundifolia* which grow successfully on the plains.

The palms grown in pots look very attractive. The species which can be grown successfully in pots are *Chrysalidocarpus luteacens*, *Howea belmoreana*, *Phoenix roebelenii*, *P. rupicola*, *Livistona chinensis*, *Actinophloeus macarthurii*, *Rhapis excelsa*, *Pritchardia grandis* and *P. pacifica*. The two popular palms for growing in ground along roads or in avenues, particularly in South India, are the Royal Palm (*Roystonea regia* or *Oreodoxa regia*) and the Cabbage Palm (*Oreodoxa oleracea*).

CYCADS

Cycas revoluta

Plants palm-like with stout, short, unbranched cylindrical stem marked with leaf-scars; leaves pinnate, dark glossy green leaflets, narrow tipped with spine.

Another species is *C. circinalis*, a native of India and Sri Lanka, producing rosette of stiff glossy pinnate leaves having leaflets with flat tips.

BROMELIADS (BROMELIACEAE)

The Bromeliads, native of tropical America, are interesting plants, many of which produce attractively coloured flowers. They are epiphytes but can be grown in pots with little soil and plenty of moss. They have rosette of nicely coloured leaves, the cup-like cavity of which can be filled with water to place a few cut-flowers for beauty. The potting mixture should contain soil (2 parts), coarse sand (1 part), leaf-mould (1 part), moss (1 part) and a little charcoal. They thrive best in semi-shade and humid conditions and should be grown in small pots. The dust on the plants should be blown off and never sponged as it will remove their silvery bloom. The plants do not require much water. The centre of the rosette should be kept full of water and the leaves sprayed occasionally to keep them free from dust.

The important Bromeliads are the Urn Plant or Exotic Brush, *Aechmea fasciata* (syn. *A. rhodocyanea*), a large spreading plant with elongated leaves which are rounded at tips and pale-grey with a silvery bloom or with bands of green and silvery grey; *A. fulgens* with long, rounded and smooth leaves, rosette-



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Bromeliads—They are interesting plants, many of which produce attractively coloured flowers. They are epiphytes but can be grown in pots with little soil and plenty of moss. They have rosette of nicely coloured leaves, the cup-like cavity of which can be filled with water to place a few cut-flowers for beauty.





Neoregelia carolinae 'Perfecta Tricolor' has glossy green leaves with ivory-white bands length-wise in the middle becoming rose-tinted in the light and carmine-red at flowering.

Cacti— For their ability to store water, live on reserves between rains and survive under the most dry and arid conditions, the cacti are aptly called the 'plant camels' or the desert plants.



shaped, green colour with a silvery bloom, deep-purple-red underside and red flowers; the Earth Stars or the Chameleon Plant, *Cryptanthus bivittatus*, with starfish-like shape and narrow stiff, pointed leaves of buff colour with reddish stripes; *Billbergia nutans* having very thin, finely serrated pale silvery-green leaves with attractive pink-marbled, blue, yellow and green flowers with protruding anthers; *Nidularium innocentii* with light green rosette of leaves with a red centre; *N. tricolor* with narrow, stiff, pointed pale-green and cream-striped leaves with a bright red centre; the Painted Fingernail Plant, *Neoregelia spectabilis*, which has metallic-green leaves that end in pronounced tips of contrasting blood red; *Neoregelia carolinae* 'Perfecta Tricolor' has glossy green leaves with ivory-white bands length-wise in the middle becoming rose-tinted in the light and carmine red at flowering; *N. carolinae* 'Flandria' with rosette or strap-shaped leaves; bordered creamish yellow, becoming red in centre at flowering; *N. carolinae* 'Meyendorffii' with rosette of flower; olive green-tinted coppery leaves, inner leaves dark maroon at flowering; and the Zebra Plant, *Vriesia splendens*, having a rosette of strap-shaped, long leaves which are dark green with horizontal, broad, dark brown bands on the lower side. The flower bract is bright orange-red with small yellow flowers. The other important Bromeliads are: *Tillandsia lindeniana* with very narrow, drooping, dark reddish-brown foliage and arrow-shaped bracts with small violet flowers; and *Pitcairnia bromeliaefolia* and *P. punicea* (dwarfer) with sedge-like leaves and tubular crimson flowers.

CACTI AND SUCCULENTS

For their ability to store water, live on reserves between rains and survive under the most dry and arid conditions, the cacti and succulents are aptly called the 'plant camels' or the desert plants. With their spines, succulent stems, waxy outer skin, a coating of wool, bristles or felt and efficient water and food-conducting tubes they are remarkably well adapted to unfavourable drought conditions. For these reasons the cacti are one of the most fascinating and popular house-plants.

All cacti are succulents but the reverse is not true. The presence of areoles, the pin-cushions or the depressed areas from which the spines, offshoots or flowers come out, is one of the chief distinguishing characteristics of a cactus. The cacti and succulents are the most bizarre and fascinating plants in an endless variety of shape, colour and texture and are unrivalled in the plant kingdom. Their common names are interesting though the botanical ones are tongue twisting in many cases. For their odd sculptured looks which in some cases have resemblances to some animals, birds and plants, many have been named after them, viz. 'Snake,' 'Grizzly Bear', 'Lizards Crab', 'Mule', 'Cow's Tongue', 'Lobster's Claw', 'Elephant's Ear', 'Rabbit's Ear', 'Rat's Tail', 'Peanut,' 'Mushroom', 'Orchid' and 'Sweet Potato'. Besides these, there are other queer names also, viz. 'Adam's Needle', 'Turk's Cap', 'Broom', 'Button', 'Old Man', 'Shaving Brush', 'Creeping Devil' and 'Living Rock'.

Several species of cacti flower freely and the brilliance and beauty of their flowers, though often short-lived, are very enchanting. Some bloom in the night and fade out before the dawn, while others flower during the day. In some the flowers may be very small, while in others it may be bigger than the plant itself.

A few are fragrant but some have offensive odour. The flowering in other succulents is usually in abundance but the flowers are comparatively small in size.

The cacti and succulents can be grown either singly in individual pots or grouped in a dish or bowl garden and in indoor table garden for creating a desert scene. The soil mixture consists of two parts each of soil, leaf-mould, sand and crushed brick, and one part each of old lime scraped from walls and crushed wood charcoal. The pots or containers must have drainage holes, which should be covered with crocks before filling in the soil mixture.

The plants are commonly propagated by cuttings or offshoots. Seed grafting and leaf cuttings (as in *Crassula* and *Bryophyllum*) are some other means of propagation. In cacti, grafting (usually cleft, flat or side grafting) is useful in obtaining large plants on slow-growing or weak plants. The rootstocks for grafting are *Pereskia*, *Cephalocereus* sp., *Cleistocactus baumannii*, *Myrtillocactus geometrizans* and *Opuntia*. The grafted cacti have their own charm.

The cacti and succulents should be watered very carefully. Avoid overwatering or water stagnation near the base, because it often causes rot, weak growth and death of plants. It may be better in some cases to water the pots from the bottom. Most of the cacti and succulents prefer a sunny situation but can be grown successfully in semi-shade also. In very strong sunlight they may show signs of sunburn, yellowing or browning.

From the numerous species and varieties of cacti (200 genera and more than 1,300 species) it is difficult to give a comprehensive and complete list. However, a few important ones are described below:

Astrophytum—Globular; 6 to 8 ribs; large yellow flowers.

Cephalocereus—Cylindrical stems covered with shaggy-white hairs. A common species, *Cephalocereus senilis*, the old Man Cactus, has slender, closely ribbed column covered with long, whitish grey hairs.

Chamaecereus—Peanut-like joints, 5-cm long, covered with soft white spines.

Echinocactus—Barrel-shaped with golden spines arranged symmetrically with a felt-like cushion, at the top of which red and yellow flowers are embedded. The popular species, *Echinocactus grusonii*, the Golden Barrel ('Golden Ball Cactus') is globe shaped, closely ribbed with golden spines and the plant grows to a very big-sized globe.

Echinocereus—A cluster up to 20 cm tall with white curly hair and large pink or purple flowers, larger than the plant.

Echinopsis—Small, either round or cylindrical, pink or white flowers; a nice attractive plant.

Epiphyllum—Shrubby notched stem with attractive, trumpet-shaped flowers.

Prefers shade, humid and moist conditions and a rich soil. Normally night-blooming.

Ferocactus—Round ribbed, long and hooked spines.

Gymnocalycium mihanovichii friedrichii (Rubra, the Red Cap)—It is a small, red-coloured globe which is grafted on *Hylocereus* rootstock for better growth. There are yellow and pink-coloured varieties also.

Lobivia (Cob Cactus)—Globular or cylindrical stems, large, lemon-yellow flowers.

Mammillaria (Pin-cushion Cactus)—Globular or cylindrical in shape, small, attractive white or pink flowers or other colours also.

Notocactus (Ball Cactus)—Globular or yellow flowers larger than the plant.

Opuntia (Prickly Pear)—Jointed stems, tiny barbed bristles in the areoles, cylindrical or oval pads. Flowers large.

Rebutia—Small, globular with spiralled tubercles; flowers freely; large, bright crimson flowers.

Rhipsalis—Similar to the epiphyllums in requirements. The smaller species, *R. salicornioides*, is suitable for growing indoors.

Trichocereus spachianus (White Torch Cactus)—Cylindrical, prominently ribbed, tall; flowers large and pure white.

Zygocactus truncatus (Christmas Cactus)—Short, flat, thin joints hang down to form an umbrella-like shape; flowers profusely.

Other succulents

Agave (Century Plant; Agavaceae)—Leaves rosette shaped, elongated, variegated. The commonly grown species are *A. victoriae-reginae*, *A. filifera*, *A. stricta* and *A. americana marginata*.

Aloe (Liliaceae)—Either a stem or rosette. *A. variegata* (Partridge-breasted Aloe), a rosette of triangular in shape, leaves edged and marble sharply with white on dark green. *A. arborescens* is tall with narrow, elongated and toothed leaves gracefully arching.

Beaucarnea recurvata (Liliaceae)—A slow-growing graceful succulent with a thick swollen base and a rosette of long, narrow, linear, recurved, bright green, pendulous leaves at the top.

Bryophyllum (Crassulaceae)—Tall and bushy. The important species are *B. pinnatum*, *B. proliferum* and *B. tubiflorum*.

Crassula (Jade Plant; Crassulaceae)—The species *C. arborescens*, *C. argentea*, *C. lactea* and *C. falcata* are popular. The low-growing species are *C. cooperi* and *C. grisea*. The two commonly grown species are *Crassula argentea*, the Jade Plant, having glossy jade green thick succulent leaves, freely branching; and *C. lycopodioides* with string-like little branches covered closely with scale-like pointed leaves. Another species, *C. imperialis* similar to *C. lycopodioides*, has more robust and thicker stems with larger leaves.

Echeveria (Hen and Chickens; Crassulaceae)—Rosettes of fleshy, beautifully

Echeveria (Hen and Chickens; Crassulaceae)—Rosettes of fleshy, beautifully coloured leaves in dense clusters; flowers scarlet, yellow or white. The well-known species are *E. agavoides*, *E. perelegans*, *E. setosa*, *E. caricolor*, *E. secunda*, *E. × scaphophylla*, *E. zahnii* 'Hoveyi', *E. elegans*, *E. glauca*, *E. gibbiflora* and *E. leucotricha*.

Euphorbia—*E. milii* (*E. splendens*; Euphorbiaceae)—This has been described earlier.

Gasteria (Liliaceae)—Rosettes of leaves; greenish flowers with pink or red tips. *G. acinacifolia* has white-spotted leaves; reddish flowers. The important species are *G. brevifolia* with white-spotted leaves, *G. hybrida* and *G. verrucosa*. *G. echinata hort* is a bold rosette with triangular, deeply concave, fleshy leaves gradually tapering to a point.

Haworthia (Liliaceae)—Small, rosette shaped. Flowers on long thin stalks, white and pink in colour. The species *H. fasciata*, *H. chalwinii* and *H. planifolia* are commonly grown in gardens.

Kalanchoe (Crassulaceae)—*K. blossfeldiana* with small scarlet flowers in clusters is the popular species. Another species *K. tomentosa* is also grown.

Lithops (Living Stones; Aizoaceae)—Plants coloured and shaped like stones; a pair of leaves divided by a fissure at the top. The two important species are *L. bella* and *L. lesliei*. It does not grow well on the plains.

Pedilanthus (Euphorbiaceae)—*P. tithymaloides* has tall, branched, spineless cylindrical stem; leaves ovate, small, dark green. There are also variegated varieties, 'Variegata' and 'Cucullata' having white-edged leaves.

Sedum (Crassulaceae)—Loose, rosettes, spirals; leaves of various shapes and colours. *Sedum tomentosum* grows successfully on the plains. The species worth growing in the hills or in mild climate are *S. pachyphyllum*, *S. adolphi*, *S. morganianum*, *S. guatemalense*, *S. allantoides* and *S. stahli*.

FLOWERING PLANTS

Acalypha hispida

FAMILY: Euphorbiaceae

ORIGIN: New Guinea

The plant produces drooping, silky red catkins or tassels (flower spikes) which impart beauty to it. A variety with pink catkins also exists.

The plant should be grown in full sunlight and moist conditions. Liquid feeding is beneficial.

Anthurium scherzerianum

FAMILY: Araceae

ORIGIN: Costa Rica

It has dark green, lance-shaped leaves with brilliant scarlet spathe and a curled spadix in the centre, which pushes up through the foliage. The plant loves warmth, high humidity, shade and frequent watering. The growth is best in the rainy season. It does best in places having mild climate like Bangalore, Mysore and Calcutta. They also perform well in parts of Kerala. The other species grown are: *A. andreanum* with white-veined leaves and scarlet spathe and white spadix, and *A. veitchii* having large-sized, ovate leaves which are highly ornamental. The hardy species, *A. ferrierense*, can be successfully grown in the plains.

Aphelandra squarrosa louisae

FAMILY: Acanthaceae

ORIGIN: Brazil

The plant has large, lance-shaped, paired leaves which are glossy, dark green with prominent ivory-coloured midrib and veins. The terminal flowers are tubular, of yellow, orange or red colours emerging from a segmented bract. It is grown for its attractive foliage and flowers. The other important varieties are 'Fascination' and 'Leopoldii'. The red-flowered variety is commonly grown in India.

It grows best in full sunlight or semi-shade but not in direct sunshine and warm and moist conditions. Frequent watering and feeding with liquid manure are essential. The plant grows best and flowers when it is pot bound. It requires organic manure like leaf-mould and cowdung manure.

Azalea (Rhododendron simsii)

FAMILY: Ericaceae

ORIGIN: China, Japan

Azaleas belong to the genus *Rhododendron*. The common species are *Rhododendron simsii*, *R. indicum*, *R. japonicum* (*R. molle*), *R. obtusum* and *R. occidentale*. They are small shrubs which do best in the hills. In the plains the plants do not grow well but survive and flower when the plants are brought from the hills in September-October and are grown in partial shade with great care. The flowers are large, single or double in various colours like white, pink, red and crimson.

The plants like sunlight, cool temperature and acidic soils. Feeding with

liquid manure and watering are regularly needed for their good growth and flowering. After flowering, watering should be reduced and after the plant enters a rest period it should be pruned lightly and given a mixture containing equal parts of soil and peat moss. The plant should be grown outside and brought indoors when it starts flowering.

Begonia

FAMILY: Begoniaceae

ORIGIN: Semi-tropical and Tropical countries except Australia

There are three main types of *Begonia*, namely, tuberous rooted, rhizomatous and fibrous-rooted. In the tuberous-rooted group are included the most exquisite, large-flowered hybrids having attractive single or double flowers in various colours like pink, red, white, cream, orange, scarlet and salmon with smooth, ruffled, waved, frilled or crested petals. The varieties having different shapes of flower are 'Roseform', 'Camellia', 'Carnation' and 'Daffodil'. Besides these there are the 'Picotee Double' begonias with a contrasting border of different colours from that of the rest of the flower and the 'Rose-bud' begonias with young flowers resembling rose buds in shades of rose and pink. The 'Pendula' or hanging begonias with drooping habit and profuse small, double or semi-double flowers, and the 'Dwarf Multiflora' with bushy habit and abundant flowers are also included in the tuberous-rooted class. The 'Pendula' begonias are ideal for growing in hanging baskets. The giant-flowered hybrid begonias can be multiplied from seeds, tubers or cuttings from tubers, and the 'Pendula' and 'Dwarf Multiflora' from cuttings and tubers. They should be grown in cool, semi-shaded, moist and humid conditions with plenty of water during the growing season.

The rhizomatous begonias are the Rex Begonia. These have been described earlier under the foliage plants. The fibrous-rooted begonias include the two best groups, viz. the Semperflorens group (*B. semperflorens*) and the other Lorraine group. In the Semperflorens group the plants are compact and bushy with bright green and glossy bronze waxy leaves having small clusters; shell-like flowers of various pleasing colours such as pale to deep pink, salmon, red, orange and white borne on graceful long stems.

The Lorraine begonias include the 'Gloire de Lorraine' and the hybrid 'Solbakken' having deep, salmon-pink clusters of flowers.

The Lorraine begonias are propagated from tip cuttings, whereas the Semperflorens begonias are mainly grown from seeds. They require light soil with rich organic manure or compost. The growing tips of the plants should be pinched occasionally to make them bushy. They grow best in partial shade and when pot bound they flower early. The plants require frequent and heavy watering.

The begonias are prized for their decorative foliage, attractive flowers and

profuse blooming. They grow best in the hills. However, in the plains only a few such as *B. semperflorens*, *B. rex*, *B. haageana*, *B. corallina* and *B. president* cannot thrive well. *B. corallina* and *B. president* cannot and *B. semperflorens* are the only flowering species which grow well in the plains.

Beloperone guttata

FAMILY: Acanthaceae

ORIGIN: Mexico

It is a medium tall plant with drooping spikes of white spotted with purple and reddish-brown or salmon-coloured, long-lasting bracts; the bracts are the main attraction, because the flowers are almost inconspicuous. It is in flowering almost throughout the year.

The plant requires rich soil with plenty of compost and warm and moist conditions. The soil should be well-drained. It thrives well in full sunshine. Liquid manure should be applied frequently. The plant has a tendency to become leggy and in such cases it should be replaced with younger ones.

***Euphorbia milii* (syn. *E. splendens*)**

FAMILY: Euphorbiaceae

ORIGIN: Madagascar

This is a popular plant having grey, prickly stems with small, bright red flowers on the ends of the spiny tips which last for a long time. It flowers for a long period, particularly during spring.

It needs light sandy soil and moderate watering. It is ideal for growing in dish gardens, trough and window-boxes. The plant flowers best when it is pot bound.

Hoya carnosa

FAMILY: Asclepiadaceae

ORIGIN: Queensland

This is a climbing plant having dark green, thick, leathery leaves and compact umbels of small, star-shaped, waxy, glistening pink or flesh coloured flowers, usually borne in hot and rainy seasons.

The plant should be trained on bamboo or cane trellis in the pots. It requires shaded or partially shaded situations and moist conditions. The plant flowers best when it is pot bound and grown in rich soil with plenty of organic manure like leaf-mould and cowdung.

***Fuchsia* (*F. magellanica*, *F. coccinea* and *F. fulgens*)**

FAMILY: Oenotheraceae

ORIGIN: Central and South America

The genus comprises several species and more than 2,000 varieties. Most of the garden varieties have arisen as hybrids from the crosses made between *F. fulgens* and *F. magellanica*. A few species and varieties are trailing and are suitable for growing in hanging baskets, they are *F. magellanica gracilis*, 'Muriel' and 'San Francisco'.

The plant is shrubby in habit and produces attractive drooping flowers which are like lady's ear drops. The sepals and petals are usually of two different colours, viz. white and red, red and purple, lilac and red, salmon and orange-scarlet, white and pink or purple. The flowers may be single or double. It is ideal for growing in pots, hanging baskets (trailing varieties), troughs, planters or window-boxes.

The plant needs cool and moist conditions for its good growth. *Fuchsia* do not thrive well in the plains of northern India but grow exceedingly well in the hills (both in the North and the South) as well as in the areas having a milder climate like Bangalore. However, the plants brought from the hills during September-October will flower in the plains in March-April.

Impatiens

FAMILY: Balsaminaceae

ORIGIN: East Africa, Zanzibar

Impatiens is related to the common Balsam (*Impatiens balsamina*). The two popular species grown as house-plants are *I. sultani*, the Busy Lizzie or Sultan's Balsam and *I. holstii*, the Patience Plant. The plant is dwarf (31 cm) with fleshy stems and small, oval, light green, toothed leaves, and small, round, pink flowers in *I. holstii* and scarlet in *I. sultani*. The stem in *I. holstii* is red, whereas in *I. sultani* it is green. The flower has a long spur. There are several hybrids resulting from crosses between these two species. The flowers in these hybrids are of various attractive colours like bright orange, pearl rose with salmon cast, deep rose, bright scarlet, red and white. These hybrids are very floriferous. They flower almost throughout the year.

The plants should be pinched back frequently to make them bushy. They require semi-shade, rich soil and plenty of water. The plants can be propagated from seeds or stem cuttings.



Begonia—The begonias are prized for their decorative foliage, attractive flowers and profuse blooming. They grow best in the hills. However, only a few, such as *B. semperflorens*, *B. rex*, *B. haageana*, *B. corallina* and *B. president* cannot are the only flowering species which grow well in the plains.



Impatiens—The two popular species grown as house-plants are: *I. sultani* (Sultan's Balsam) and *I. holstii* (Patience Plant). The flowers are of various attractive colours like bright orange, pearl rose, deep rose, bright scarlet, red and white.



Orchids (Orchid Dendrobium Hybrid)—Epiphytic orchids of great horticultural merit, grown in hot-houses and greenhouses,

Lantana sellowiana

FAMILY: Verbenaceae

ORIGIN: Montevideo

It is a small, trailing plant resembling *Verbena*. The flowers are pale purple and borne in profusion during spring.

It is ideal for growing in window-boxes or in shallow dishes, pans and troughs. The plants require full sunlight and good watering.

Orchids

FAMILY: Orchidaceae

Several orchids are natives of the eastern Himalayan in Assam and Darjeeling hills and in South India on high lands such as Kodaikanal. They are natives of the tropical areas of the world like Burma, Sri Lanka, Java, Borneo, Hawii, Thailand, Brazil and South Africa. They can thrive well only in a few places like Arunachal Pradesh, Assam, Sikkim, Darjeeling and other parts of West Bengal and in Kodaikanal, Coorg and Kerala in southern India. In the northern plains orchids do not grow so well and die during summer months.

Both epiphytic and terrestrial, orchids can be grown as house-plants with great care. However, in view of their most exquisite and long-lasting blooms, the culture of orchids is rewarding. The important epiphytic species are *Aerides affine* with rose-coloured blooms, *Coelogyne cristata* (white), *Vanda coerulea* (blue), *Dendrobium aggregatum* (rose purple), *Cymbidium*, and a few others. Among the terrestrial orchids, *Arundina graminifolia* (pale pink mauve), *Phaius maculatus* (yellow), *Spathoglottis plicata* (pale pink mauve) and *Paphiopedilum* or 'Lady's Slipper' are commonly grown.

The orchids that flower on the plains year after year are limited to *Aerides multiflorum* (*A. affine*), *A. odoratum*, *Cymbidium aloifolium*, *Dendrobium pierardii*, *D. moschatum*, *Phaius wallichii*, *Saccolabium guttatum*, *Pholidota imbricata* and *Vanda tessellata* var. *unicolor* (*V. roxburghii*), which are native to this country.

The epiphytic orchids are usually grown on hanging logs or small pieces of wood with the roots covered with a thin layer of dried moss or coconut fibre. Sometimes they are also grown in small hanging pots which are perforated round the sides for aeration and drainage. The potting mixture contains equal parts of small broken pieces of brick, coconut husk, dried moss and peat, small dried pieces of bone and small pieces of charcoal. For the terrestrial orchids the potting mixture contains equal parts of cowdung manure, leaf-mould, soil, sand and crushed charcoal. The potting of orchids should be done in February after their winter rest period. They will bloom in March-April or August- September, depending upon the species. On the hills they should be grown in heated rooms, if it is a tropical species.

The orchids should be watered frequently and kept cool under humid and moist conditions, particularly during the summer months.

***Pelargonium* spp.**

FAMILY: Geraniaceae

ORIGIN: South Africa

The geraniums are botanically known as *Pelargonium* species particularly *P. zonale*. There are four main groups of *Pelargonium* species, viz. zonal varieties (geraniums) (*P. zonale*), ivy-leaved varieties (*P. peltatum*), show or fancy type (*P. domesticum*) and scented-leaved varieties. Each group has several varieties. The zonal types (*P. zonale*) are the most popular kinds which are characterized by the presence of a darker zone of horse-shoe shape on the foliage; the leaves are roundish with wavy margins covered with fine hairs. There are varieties with variegated leaves also. The flowers are round and flat and are single or double in various colours like red, pink, white, scarlet, purple, salmon and vermillion. The ivy-leaved geraniums having trailing stems are not so well-suited for growing indoors as *P. zonale*. In the show and fancy species, the flowers are funnel shaped unlike those in other species and the leaves are palmate and toothed. The scented leaves of *Pelargonium* spp. have either lemon or peppermint scent in their foliage. The species *P. graveolens* has rose-like scent, whereas *P. crispum* varieties have lemon-like scent. *P. fragrans* has nutmeg scent and *P. tomentosum* has peppermint scent. Several of these scented-leaved *Pelargonium* spp. also produce attractive flowers. Now there are some F₁ hybrid geraniums which can be grown from seeds unlike other varieties that are propagated from cuttings.

The geraniums and *Pelargonium* thrive best in the hills or in areas having a mild climate like Pune, Trivandrum, Bangalore and Mysore. In the plains of the northern India they do not grow so well and often die during summer or rainy season. With great care and when kept protected under shade the plants may survive for a few seasons. A few zonal varieties are hardy and can survive throughout summer and monsoon seasons in the plains. The plants brought from the hills during September-October grow well in the plains and flower during February to March or April.

The *Pelargonium* and geraniums are excellent plants for growing indoors. They require full sunlight, plenty of water, cool temperature and well-drained soil.

Poinsettia (Euphorbia) pulcherrima

FAMILY: Euphorbiaceae

ORIGIN: Mexico

The terminal, long, scarlet floral bract is the main attraction of the plant.

The actual flowers borne in the centre of the bracts are small, knob-like and insignificant in appearance. The flowers are borne during winter. The plants are tall. There are varieties having greenish-white or cream-coloured bracts (var. *alba*) and also with double bracts (var. *plenissima*). Two varieties have pink bracts.

Since the plant bears flowers on the current year's growth the stem should be cut about 1 or 2 buds above the base after the flowering is over. The plant requires cool and moist conditions and full sunlight to develop bright colour.

Primula

FAMILY: Primulaceae

The four commonly grown species are *P. sinensis* (a native of China), *P. obconica* (China), *P. malacoides* (Yunan) and *P. kewensis*. In *P. sinensis* the flowers are larger and of brilliant colours like flesh pink, dark red, orange, purple and of blue and various other intermediate tones. The flowers of *P. obconica* are in shades of red, pink, purple and white with a yellow centre in most of the varieties. *Primula malacoides* is popularly known as Fairy or Baby Primrose, because it produces dainty flowers on long stems in abundance. The bright yellow flowers of *P. kewensis* are different from the usual pink, red, purple or blue primroses.

The plant thrives best in the hills or in mild climate. In the plains of northern India it does not grow satisfactorily. However, *P. malacoides* can be grown successfully on the plains as an annual. It needs cool and moist climate. The plant also requires plenty of sunshine but not direct sunlight, and regular watering and liquid feed at least once a fortnight. Leaf-mould does not suit this plant and therefore it should not be added to the potting mixture.

Rosa spp.

FAMILY: Rosaceae

Miniature or Fairy roses are excellent plants for growing indoors. They have descended from two dwarf China roses. *Rosa lawrenciana* and *R. royleana* are dwarf (about 10 to 15 cm) and compact with fern-like leaves and small, well-shaped Hybrid Tea Type flowers, whereas those from *R. lawrenciana* are taller (about 20 to 25 cm) and more robust, having slightly larger rambler-rose blooms.

The Miniature roses are usually grown in small pots, vases, troughs, tubs or window-boxes. They can be placed on window-sills, shelves, tables or trolleys. They look very attractive in light grey or blue and white porcelain or stone vases, bowls or troughs. For keeping indoors the potted roses should be brought inside, when the flower buds appear on the plant and these must be removed

frequently outdoors for a few days before bringing them again in the room. It is always a good practice to have a duplicate set of these plants so that these can be brought inside or taken outdoors alternately. A few outstanding varieties are 'Baby Gold Star' (golden yellow), 'Baby Masquerade' (yellow turning to pink and red), 'Coralin' (red orange), 'Cri-Cri' (salmon pink), 'Little Buckaroo' (valvety red), 'Perla de Montsarrat' (rose pink), 'Prince Charming' (scarlet crimson), 'Rosina' or 'Josephine Wheatcroft' (golden yellow), 'Rosemarin' (silver rose), 'Simple Simon' (rose pink), 'The Fairy' (white-shaded pink), 'Tinkerball' (rose-red), 'Tom Thumb' (crimson) and 'Twinkles' (white). There are also climbing Miniature roses like 'Clg. Jackie' (yellow), 'Clg. Little Buckaroo' (bright red) and 'Clg. Pink Cameo' (rose-pink). The dwarf polyanthas ('Ideal', 'Madam Gladstone', 'Cameo', 'Granada', 'Vatertaz') and the dwarf Floribundas like 'Rumba' and 'Samba' are also grown indoors.

These roses flower profusely and almost continuously for a long period during December to April and to some extent during the rainy season. The best time to plant the Miniature roses is during September – October after the rains. A sunny location and well-drained soil are important for successfully raising them. The plants are propagated from seeds, cuttings or budding. They require almost no pruning except light tipping or removal of dead shoots. The Miniature roses do not require heavy feeding as they may lose their characteristic dwarf and compact habit under rich manuring. Unlike other roses, the Fairy roses are not much affected by diseases and insect pests.

The recently introduced new Miniature roses are 'Stars'n Stripes' (striped red and white), 'Red Dot' (rich red), 'Cupcake' (pink), 'Hombre' (light pink with light yellow base), 'Valerie Jean' (deep pink), 'Corn Silk' (yellow), 'Rise'n Shine' (deep yellow), 'Softee' (ivory white, thornless), 'Autumn Fire' (bright orange), 'Snow Bride' (white) and 'Dream Glo' (red and white with white reverse).

Saintpaulia ionantha

FAMILY: Gesneriaceae

ORIGIN: East Tropical Africa

The African Violet (*Saintpaulia ionantha*) is one of the best flowering plants suitable for growing indoors. It produces blooms almost throughout the year. The plant has thick, fleshy, heart-shaped leaves. The flowers are round, flat and blue with yellow anthers in the centre. The modern varieties now have blue, pink, mauve, white and bicoloured flowers which may be single or double. There are numerous varieties available, several of which are hybrids. It is ideal for growing in terrarium and bottle gardens.

The plant grows best under cool, moist and humid conditions. It requires full sunlight for blooming and in insufficient light it fails to produce flowers. The plant should always be watered from bottom and not from the top, because

the water falling on the leaves may cause spotting and rotting. The plant can be grown successfully under artificial light if it is provided for about 16 hours a day. The best flowering is on the plants which are pot bound. The plant responds well to liquid feeding for producing flowers.

***Verbena erinoides* (V. laciniata)**

FAMILY: Verbenaceae

ORIGIN: South America

It is a low-growing perennial *Verbena* having white, mauve and pink flowers and finely-cut leaves. The flowers are produced during the summer months. It spreads rapidly.

This is an ideal plant for hanging baskets, window-boxes and troughs. It requires moist soil and grows well in semi-shaded as well as in sunny situations.

Zantedeschia aethiopica

FAMILY: Araceae

ORIGIN: South Africa

The leaves are large, dark green, arrow-head shaped, while the flowers are attractive spathes of white colour. There are also species with yellow (*Z. elliottiana*) and pink spathes (*Z. rehmannii*)—natives of Transvaal and Natal respectively. They flower in March.

It does best in a mild climate in Bangalore or in the hills. Its growth in the plains is not satisfactory. The plant needs cool and moist climate and likes liquid food and full sunlight for its good growth.

FLOWERING PLANTS FOR A TEMPORARY DISPLAY

A few flowering plants such as *Calceolaria*, *Cineraria*, *Cyclamen*, *Chrysanthemum* and *Salvia* can be raised outdoors and brought inside the rooms when they have started blooming. They will provide a quick and temporary colourful display and can be effectively arranged along with the foliage plants. They could be removed outdoors once the flowering is over.

Calceolaria

FAMILY: Scrophulariaceae

ORIGIN: Central and South America

The genus *Calceolaria* has both annual and perennial species. The herbaceous perennial species is *Calceolaria herbeophybrida* which is probably a hybrid resulting

from a cross between *C. corymbosa* and *C. crenatiflora*. It is a dwarf plant with dark green foliage and produces large trusses of pouch-like flowers of various gorgeous colours, many of which are attractively tinged, blotched, spotted and laced in unique patterns, borne above the foliage. The flower colour may be bright orange, brown, yellow, red, purple or light shades of apricot, rose and terracotta. There is a dwarf species *C. multiflora nana* having smaller flowers.

Calceolaria does not thrive well in the plains. It grows exceedingly well in the hills. However, hardy, pale-yellow flowering species *C. maxicana* can be grown successfully in the plains of northern India. It is a medium-tall plant producing small, soft, pale-yellow, pouch-like flowers well above the foliage. It should be grown in pots in partial shade.

Calceolaria is grown from seeds. Its very fine seeds should be sown thinly in the seed-pan, which may be covered with a sheet of glass until the germination takes place. For watering, the pans may be partially submerged in a shallow basin of water and removed after water reaches the top of the soil. The shoots in young plants should be pinched to encourage branching. In the plains the seed may be sown in September-October to obtain flowers in February-March, while in the hills it can be sown in June-July. Young plants are to be protected from frost during winter. The flowering in the hills takes place during the summer months.

The plant needs cool and moist conditions and should be kept away from droughts. It is grown in partial shade. When the flowers appear, liquid manure should be applied as it is beneficial for good flowering.

***Chrysanthemum morifolium* (*C. hortorum* or *C. sinense*)**

FAMILY: Compositae (presently Asteraceae)

ORIGIN: Europe, Asia, Africa and America

The chrysanthemum requires great care and constant attention for a long period before it comes into bloom. Its culture therefore is not convenient, particularly to those who want to grow it indoors and have no outdoor space for raising plants. It is therefore better for the indoor gardeners to purchase full-grown plants or those in bloom from local nurserymen or florists for keeping them inside the room for temporary display.

Chrysanthemum varieties are classified into 7 groups, viz. the Incurved (like a perfect ball), Reflexed (with drooping florets), Incurving (in which the petals incurve loosely and irregularly), Anemone (having single petals and a tubular central disc and five rows of ray florets), Miscellaneous like 'Spider' (with a hook at the tip of petals), 'Spoon' (with a spoon-like tip of petals), 'Koareans' (having small single or double flowers with a visible central disc), and 'Rayonnantes' (having quilled petals). There are also 'Pompon' and 'Button' chrysanthemums having small globular flowers in different shades like white, pink, purple, lilac, yellow and golden.

This classification of *Chrysanthemum* cultivars is commonly adopted in India. However, there are different classifications followed in the UK, USA, Australia, New Zealand and Japan.

The plants are propagated from seeds, suckers or cuttings. Plants raised from seeds do not come out true to the type and hence are not used much except when one wants to raise new varieties. The seeds are best sown in September/October in the plains and it takes about a year for the plants to bloom after the sowing of seeds. For the indoor gardeners who want to raise their own *Chrysanthemum* plants, it is necessary to adopt a simpler procedure than the one commonly followed by the outdoor gardeners who generally want exhibition blooms on the plants.

The best method is to behead the plants in early February in the northern plains after the flowering is over. This will encourage the production of suckers at the base of the old mother plant. The pot should be kept in a verandah or balcony and watered frequently. Due care should be taken to protect the plants from hot sun and excessive rains. The pot should be well drained. The suckers may be taken out in August and planted individually in 20-cm pots containing a mixture of 1 part soil, 1 part sand, 2 parts leaf-mould, 2 parts cow-dung manure, $\frac{1}{4}$ part each of small pieces of wood charcoal and wood ashes and 2 tablespoonfuls of bonemeal. The plants should be watered frequently.

Stopping and disbudding in some varieties may be necessary to produce larger and better-quality blooms. The young plants are pinched or stopped by removing the tip of the main stem at the time when the young lateral shoots or 'breaks' are just appearing in the leaf axils.

Stopping will induce the lateral shoots to develop from the axils of leaves. Generally, 1, 3 or 6 stems are retained for obtaining large-sized exhibition blooms. At the end of each stem there develops the first crown bud, which is allowed to develop and the lateral growths arising in the leaf axils are disbudded. However, in the 'Pompons', 'Singles', 'Koareans' and 'Sprays' no disbudding is practised. Sometimes, in a variety the first crown buds are removed and the second crown buds retained to obtain flowers. These second crown buds, in general, produce smaller flowers but of more intense colour, particularly so in the pink varieties. The date of blooming depends mainly on the variety, the time of starting the suckers or cuttings and the dates of stoppings and disbuddings. The plants will need staking in October.

Liquid manure can be applied once a week after the appearance of flower buds till the flowers are half open. Overfeeding the plants should be avoided. About 28 g of sulphate of potash added to 2 litres of water and a pint of this mixture applied to each plant at the time of appearance of flower buds is beneficial for flowering.

The plants require frequent watering but not overwatering. The grubs of Chafer beetle appear usually in July – August at the base of the pot and cause the wilting of plants. These grubs should be removed by hand and destroyed. It is also useful to mix a little of 5@ BHC and DDT dust mixture in the soil.

The aphids which appear during the cold months can be controlled by spraying Malathion or Basudin, 2 g in 1 litre of water. Wilt and powdery mildew are the common diseases. The wilted plants should be uprooted and burnt as soon as they appear. To control the powdery mildew dusting with sulphur is useful.

Cineraria (Senecio cruentus)

FAMILY: Compositae

ORIGIN: Canary Islands

The species *Senecio cruentus* is the progenator of the modern garden cinerarias. These are excellent shade-loving pot-plants having daisy-like flowers of white, lavender, pink, purple, blue, scarlet and red. They are propagated from seeds. The soil mixture for pots contains 4 parts loam, 2 parts leaf-mould and 1 part sand with a little wood ash. The plants should be protected against strong sunlight and watered frequently. The different types grown are the 'Large Flowered Singles', 'Stellata Singles' with star-like petals and open habit, 'Feltham Beauty Strain' having flowers with white centres, intermediate varieties which are freely branching with smaller heads, and the 'Multiflora Nana' of dwarf including the 'Nana Compacta' having a dwarf compact habit. The double-flowered strains are not so popular as the singles.

The seeds are sown in September in the plains. The plants flower during February-March. In the hills, the seeds are sown in May and June, and plants flower during spring and early summer.

Cyclamen persicum

FAMILY: Primulaceae

ORIGIN: Mediterranean region

Cyclamen is one of the most beautiful flowering plants which can be kept indoors for a temporary display. The commonly grown species is *C. persicum*. It has heart-shaped and attractively marked leaves with fleshy stalks. The flowers are borne on long, erect stalks well above the foliage. The flower colours are delicate pastel shades of pink, purple, red and white and various other hues. The flowers have reflexed petals in a wind-blown manner appearing like delicate butterflies with their wings swept back. In some varieties the flowers are fringed, frilled, margined and fragrant.

Cyclamen does not grow satisfactorily in the plains but thrives well in the hills. It lasts for only a year on the plains. The plants are raised from seeds or corms. It is easier to grow plants from corms. The corms are planted in August and the young plants are brought inside the room in September to bloom from December to April or May.



Geranium—The geraniums are excellent plants for growing indoors. They require full sunlight, plenty of water, cool temperature and well-drained soil.

Chrysanthemum—They require great care and constant attention for a long period before it comes to bloom.





Amaryllis—It produces trumpet-shaped flowers in clusters of 2 to 4 or 5 flowers on long stalks. The plant needs warm and moist climate and flowers best in full sunlight.

The corms may also be planted in February. The corm is set about half in and half out of the soil in a small pot. The potting mixture contains soil, sand and leaf-mould in equal proportions. After the flowering is over, watering should be reduced slowly and in June the pot may be taken out from the room and kept in a cool, shaded place until August when these are repotted. The seed is best sown in September or during August to November in a seed-pan and covered with glass and paper until the emergence of seedlings. The seedlings are transplanted in small individual pots in March-April and watered carefully. The plants will flower after about 16 to 18 months of sowing.

The plant requires partial shade, and cool and moist climate for good growth. The soil must be well drained. The pots should always be watered from bottom to avoid rotting of the crown of the plant. When the flower buds appear liquid manure should be applied along with a little potash to the plants once a month or so to encourage better flowering.

Salvia

FAMILY: Labiatae

ORIGIN: California, Brazil

The two common species, *S. splendens* and *S. farinacea*, are perennials but treated as annuals. Both are raised from seeds. The Scarlet Sage (*S. splendens*), a native of Brazil, produces bright scarlet flowers. The dwarf varieties are the 'Blaze of Fire', 'Fireball' and 'Harbinger'. Another dwarf variety 'Scarlet Pygmy' is only 15 to 20 cm tall. A few other varieties are 'Globe of Fire', 'Bonfire', 'St. John's Fire' and 'Evening Glow'. The other species, *S. farinacea*, which is a native of Texas, possesses lavender-blue or white flowers. It is hardier type which can be sown in early August, while the Scarlet Sage requires protection from strong sunlight and does well in cold weather. However, both species are shade loving. Both can be sown from May onwards until September to October, depending on the approach of winter. The plants are affected by cold weather. In mild climate they can be grown almost throughout the year. *Salvia* blooms about 2 to 2½ months after transplanting and continues to flower for several months. The blue-flowered *S. farinacea* does better in early sowings than the Scarlet Sage (*S. splendens*) which prefers cold weather. In the hills the seeds can be sown in February-March or April. They flower during summer and autumn. The plants can also be raised by seeds, although the seed germination is slow and erratic. The suitable potting mixture consists of 4 parts of soil and 1 part each of leaf-mould, well-rotted cowdung manure and sand. When the seedlings are 10 cm long they should never be allowed to become pot bound.

Salvia patens has 46-cm long spikes or brilliant deep blue flowers. It can be sown in October in the plains and in March-April in the hills.

BULBOUS FLOWERING PLANTS***Clivia miniata***

FAMILY: Amaryllidaceae

ORIGIN: South Africa

It is a handsome, evergreen, bulbous flowering plant. The plant has long, strap-shaped green leaves and produces large umbels of orange-yellow or scarlet, funnel-shaped flowers in summer. It is grown like *Amaryllis*. The bulb is planted in February-March in the hills. It does not thrive well in the plains.

The plant thrives best in a sunny situation and likes warm and moist climate. Liquid feeding during summer is beneficial to the plant.

Eucharis grandiflora (E. amazonica)

FAMILY: Amaryllidaceae

ORIGIN: Columbia

The leaves of this plant are large, ovate-lanceolate, about 45 cm long and dark green. It flowers during the rainy season producing 5 to 7 large, white, sweetly-scented flowers in a scape. The flowers in *Eucharis* are smaller than those in *Crinum*. The bulbs can be planted during March-April in the plains where it does better than in the hills. It requires warm and moist conditions and thrives well in semi-shaded situation. The plant does not require frequent repotting.

Gloriosa superba

FAMILY: Liliaceae

ORIGIN: India

Gloriosa superba, the Climbing Glory Lily, has tendrils with the help of which it can climb on trellis or screen and produces exquisite flowers which are primrose yellow on opening, changing to dark-red or orange-red with wavy and heavily corrugated petals. Its tubers are long and of pencil thickness. There are as many as 70 varieties grown in the National Botanical Research Institute, Lucknow (Uttar Pradesh).

Plant the tubers horizontally in March-April. The flowers are produced during July-September. The plant requires frequent watering and light soil. *G. rothschildiana* is also another commonly grown species. *G. carsoni* and its varieties are also worth growing. In the hills it is not a hardy bulb; the plants are susceptible to frost. In its native home in Mysore, *G. superba* flowers during September to November. It is also found growing wild in Uttar Pradesh and other areas.

Haemanthus multiflorus

FAMILY: Amaryllidaceae

ORIGIN: Tropical Africa

This plant produces large, ball-shaped or puff-like scarlet or bright red flowers on long and stout stalks during May-July. In the hills the flowers are borne in June-July.

The bulb should be potted in February in the plains and in March-April in the hills. It thrives well in sunny weather and moist soil.

Hippeastrum hortensis (Amaryllis belladonna)

FAMILY: Amaryllidaceae

ORIGIN: South Africa

It produces trumpet-shaped flowers in clusters of 2 to 4 or 5 flowers on long stalks. In the plains it flowers during March-April, while in the hills it blooms from winter to summer depending on the time of planting. The bulbs can be planted in September-October or December-January in the plains, preferably during December – January, when the bulbs are dormant and during October to March or April in the hills inside the room. In the plains during October to December, when the leaves start drying, watering should be withheld to facilitate the bulbs to rest. This helps to obtain quality blooms in summer. Watering should be re-started from December or January onward to encourage the production of foliage. In milder climate the plants do not become dormant particularly when the winter is not cold. In the hills watering should be withheld in early winter to force the plant into a rest period and store the bulbs in a cool place till December when they are replanted and watered.

The small-flowered types bear larger number of flowers on a stalk. The large-flowered Dutch Hybrids with giant-sized flowers, as large as 12 cm across, bear a fewer number (2 to 4) in a cluster. The flower may be dark red, scarlet, red, white, deep, pink orange, salmon, white with red stripes, or white stripes on solid colours. The actual *Amaryllis belladonna* grows on the hills only.

The plant needs warm and moist climate and flowers best in full sunlight. The pot-bound plants flower better than those planted in larger pots. While planting, about one-half to three-fourths of the bulb should be kept above the soil and the bulbs planted individually in a 15-cm pot.

Hyacinthus orientalis

FAMILY: Liliaceae

ORIGIN: Italy eastward to Mesopotamia

Hyacinth does not grow well in the plains but thrives well in the hills. The plant has narrow, long and erect leaves, from the centre emerges a stout spike of small, bell-shaped flowers borne all round the central stalk. The flowers may be lilac, light blue, purple, white and cream in colour.

When grown indoors in the hills the bulbs are forced to bloom early. The bulbs are first planted in pots, about 4 or 5 in a 15-cm pot, with their nose a little below the rim of the pot and the soil firmed around them. The pot should be set in the open in a trench with the rim of the pot about 2.5 to 5 cm below the soil level and stakes and labels put to identify the pots later. The pots may be kept outdoors in the trench for about 3 months. Later when shoots are 2.5 to 7.5 cm tall the pots may be shifted indoors and kept in a cool and dark place for about a week or fortnight and then moved to a sunny window to flower in early spring. The bulbs can be planted during October to December. Sometimes the bulb when brought indoors is grown in pebbles instead of soil or in a special type of glass container called the Hyacinth glass, if the water level is kept just below the bottom of the bulbs. After flowering the pots should be removed outdoors after the last frost for repotting.

***Hymenocallis littoralis* (syn. *Pancratium littorale*)**

FAMILY: Amaryllidaceae

ORIGIN: South America

The plants are 30 to 60 cm tall with long, broad, strap-shaped leaves. The flowers are white, spider-like and fragrant with long, delicate, narrow segments united at the base by a membranous cup or corona. The flowers are borne in umbel on long stalks during the rainy season.

The bulbs are planted in September-October after the flowering is over. The Spider Lily is treated in the same way as *Eucharis*. The plants require a rich and well-drained soil for a good growth. They can be grown in sunny and semi-shaded situations. The plants thrive well in pots.

Lilium longiflorum

FAMILY: Liliaceae

ORIGIN: Ryukyu Island, Formosa

Lilium longiflorum (Easter Lily) is tall-growing with fragrant, trumpet-like pure white flowers. It flowers during May-June in the northern plains, while

in the hills it blooms in March-April. The plant prefers a sunny situation. The bulb can be planted in September or October in the plains, while in the hills it may be planted in October. After flowering is over the bulbs may be dried and rested for several weeks before they are planted outdoors in a sheltered and well-drained area. The bulbs of the Easter Lily can be forced in the same way as those of hyacinths.

Muscari botryoides

FAMILY: Liliaceae

ORIGIN: Southern Europe

Muscari botryoides (Grape Hyacinth) is a small plant having long, narrow grass-like leaves and a spike of small, globular flowers on the stalk well above the foliage. The spike of blue flowers resembles a grape bunch. There is also a variety bearing white flowers. *M. tubergenianum*, a native of north-western Iran, having pale and dark-blue flower spikes, is also commonly grown. The flowers of Grape Hyacinth are sweetly scented. In the northern plains Grape Hyacinth grows well. It can be planted during September-October to flower in February-March and in October-November in the hills to bloom in early spring. In the hills the bulbs can be forced in the same way as described for hyacinths.

***Narcissus* spp.**

FAMILY: Amaryllidaceae

ORIGIN: Northern Hemisphere; Switzerland through southern France to Spain and Portugal, British Isles, Canary Islands, Mediterranean area, Asia, Japan and North Africa

All narcissi and daffodils botanically belong to the same genus *Narcissus*. There are 11 divisions of different types of narcissi and daffodils, viz. Trumpet, Large Cupped, Small Cupped, Double, Triandrus, Cyclamineus, Jonquilla, Tazetta, Poeticus, Species and wild forms and hybrids and miscellaneous. The plant is short, about 45 to 60 cm tall, whereas some species are only 8 cm high, having long, narrow, grass-like green leaves. The flower is borne on a long stalk and consists of a narrow perianth tube—at the top of which there are 6 perianth segments and a corona or trumpet or cup which projects forward from the centre of the perianth. The length of the perianth tube depends upon the species and varieties. The colour of the perianth may be white or yellow and occasionally lemon or reddish. The size, shape and colour of the corona varies in different varieties. The trumpet may be large, small, or almost flat like a very flat saucer. The shape is cylindrical, cup-shaped or bowl or goblet-like with sharp-cup, rolled or serrated edges. The colour may be yellow, white,

red or pink or a combination of two or more of these colours. In some the cup may have a very thin, red or yellow edge or the colour may extend half way down the corona in some cases. Usually there is only one flower to a stem, but the Triandrus and Jonquil hybrids may have 2 or 3 and in the Tazetta as many as 10 or more flowers.

The flowers in the Tazetta, Jonquil and Poeticus hybrids have strong scent, while in some like the Cyclamineus and Triandrus hybrids there is no scent and in others they may be mildly fragrant.

Narcissi and daffodils are commonly grown indoors. The 'Paper White' and 'Grand Soleil d' Or' and a few other varieties are ideal for growing indoors. They can be successfully grown both in the northern plains and in the hills. *Narcissus tazetta* (Nargis) flowers in the plains, but the daffodils do not grow so successfully. For growing indoors the bulbs are planted in pots or bowls. The potting mixture contains equal parts of loam soil, sand and leaf-mould with half a part crushed charcoal. The number of bulbs to be planted depends on the size of pots and on personal choice, whether one wants a mass of bloom or well-spaced blooms. About 6 to 9 bulbs can be planted in a 15-cm pot. The bulbs should be planted with their tips protruding just above the surface of the soil, but about 2.5 cm below the rim of the pot to allow room for watering. After gently firming the soil around the bulbs, the pot should be watered thoroughly.

The pots may be kept in a covered box in a cool, dark and airy room or on a cool ventilated cupboard and watered periodically. Sometimes these pots may be placed in the trenches outdoors for about 10 to 12 weeks for forcing as mentioned earlier for the hyacinths. After about 3 weeks when 5-7 cm of top growth has appeared, the plants can be first brought indoors into a warmer place for about a fortnight till the emergence of flower buds and then transferred to a sunny window inside the living room.

Sometimes the bulbs are also planted in bowls which contain only bulb fibre. In India, bulb fibre is not available. Moist moss with a little crushed charcoal or pebbles can be used. In other countries they are also grown in water in special types of glass containers called the hyacinth glasses, which are used for growing hyacinths. While growing in pebbles or hyacinth glasses the base of the bulb should be kept just above the surface of the water which may have a few small pieces of charcoal in it.

For growing in pebbles the best method is to first place a little charcoal in the bottom of the bowl and then spread 4 to 5 cm thick layer of sand evenly over it. The bulbs may be filled up with pebbles. The bowl should be watered in such a way that the water reaches just below the base of the bulb but not above it.

The best time to plant the bulbs in the northern plains is during September or October. The flowers are borne during December to February or March. In the hills, the bulbs can be planted from the middle of September till the end of October to force the bulbs in time for flowering in late winter and early

spring. It is always a good practice to plant the bulbs at intervals of 15 to 20 days to ensure a longer blooming period.

Nerine sarniensis

FAMILY: Amaryllidaceae

ORIGIN: South Africa

Leaves of this plant are long, narrow and green. Flowers are spider-like in shape with 6 petals (perianths) borne in an umbel at the terminal end of a long stalk. The flowers are very showy and deep red in colour. The plant is leafless at the time of flowering during August-September and leaves appear after flowering. Some species have leaves at the time of flowering. In the hills it flowers during September-October.

It can be grown in the same way as *Amaryllis*. The bulbs may be planted in December-January after they have been dried and put to rest.

Polianthes tuberosa

FAMILY: Amaryllidaceae

ORIGIN: Mexico

The flower spikes of tuberose are about 60 to 90 cm tall having closely set, wax-like, pure white and sweetly scented flowers. There are varieties with single and double flowers. It flowers during the rainy season (August-September) in the northern plains. The bulbs can be planted in February or March. After flowering the stems should be cut down to encourage new growth later during the season. The plants at flowering need staking to support the heavy weight of the flower spikes.

Sinningia speciosa

FAMILY: Gesneriaceae

ORIGIN: Brazil

Sinningia speciosa, the gloxinia produces brightly coloured, large, open, bell-shaped flowers in profusion well above the thick, velvety, green foliage. The flower colour may be bright red, purple, deep scarlet, violet-blue, pink, pure white or blue with a white border or scarlet with a white border. In some varieties the flowers have white throats. It does not grow well in the plains but thrives well in Bangalore.

In the hills the tubers can be planted in February-March to produce flowers in summer months. The plant requires light and moist soil and responds well to liquid feeding during the growing season. It can also be propagated from

seeds and leaf cuttings but for the indoor gardener it would be convenient to plant tubers.

Sprekelia formosissima

FAMILY: Amaryllidaceae

ORIGIN: Mexico and Guatemala

Its flowers are large, attractive and of unusual brilliant crimson colour, borne vertically upon the stalk like a cockade. It flowers during the summer and rainy seasons. The bulbs should be brought to rest by withholding water as done in *Amaryllis*. The bulbs are planted in February or March in the northern plains. In the hills it can be planted in March or April.

Tulipa

FAMILY: Liliaceae

ORIGIN: Europe, Western and Central Asia and North Africa

The cultivated tulips first came to Holland from Turkey during the middle of the sixteenth century. They were cultivated there since long. There are various types of garden tulips that are under cultivation. The early tulips are 'Duc Van Thal', 'Single Early', 'Double Early'; mid-season tulips like 'Mendel' and 'Triumph'; and late-season tulips like 'Darwin', 'Darwin Hybrids', 'Breeders', 'Lily Flowered', 'Cottage', 'Rembrandt', 'Bizarre', 'Bijbloemen', 'Parrots', 'Double Late' and 'Species' tulips and their hybrids.

The flower is cup-shaped with 6 petals. The shape, colour and size of flowers vary in different classes of tulips. The flowers are self-coloured or a combination of two or more colours and in some striped and marked with contrasting colours. The colour ranges from white to black including red, scarlet, crimson, terracotta, orange, pink, purple, violet, chocolate, brown, cherry, magenta, salmon, carmine, rose, cream, yellow, apricot, lilac, mauve and blue. With such a bewildering range of most attractive flower colours and with exquisite flowers, the tulips rank high among the garden flowers. The economy of the bulb- and flower-growers of Holland is mainly based on tulips.

Tulips are excellent subjects for growing indoors in pots or bowls, preferably by forcing the bulbs as done in hyacinths and daffodils. They should be treated in the same way as narcissi and daffodils. They thrive well in Kashmir, Kulu Valley and other hilly regions but do not grow well in the plains. Sometimes a few poor specimens of tulips flowering in pots can be seen in the flower shows in Delhi. A tulip species, *Tulipa stellata*, a native of the north-western Himalayas, is ideal for growing in bowls. It also flowers in Delhi. The flowers of *T. stellata* are small, white with reddish exterior and appear attractive when grown in a mass. When they are grown in Delhi they are attacked by aphids during

winter. The bulbs can be planted in October to produce flowers during February or March.

Zephyranthes

FAMILY: Amaryllidaceae

ORIGIN: South America

This is a short-growing plant with very narrow, grass-like leaves and crocus-like flowers. The common species are *Z. candida* with white flowers, *Z. rosea* with pink flowers and *Z. sulphurea* having yellow flowers. *Zephyranthes grandiflora* is a large rose-pink-flowered species. They bloom during the rainy season. There is also a hybrid *Cooperanthes*, resulting from the cross made between *Cooperia* and *Zephyranthes*. Its flowers resemble those of *Zephyranthes* and is very hardy type, blooming for a long period and grows well even under the least favourable conditions.

When grown in pots, 6 to 8 bulbs can be planted in a 20-cm pot during March-April. To obtain a colourful display, bulbs of all varieties, viz. pink, white and yellow, can be planted in the same pot instead of planting bulbs of each colour separately.

APPENDIX

LIST OF PLANTS

Easy to manage for beginners

Aglaonema
Araucaria
Aspidistra
Chlorophytum
Dieffenbachia
Dracaena
Ficus elastica
Ficus lyrata

Impatiens sultanii
Maranta
Monstera deliciosa
Philodendron scandens
Sansevieria
Scindapsus
Tradescantia fluminensis
Zebrina pendula

For dark corner

Araucaria
Aspidistra
Maranta
Monstera deliciosa
Philodendron scandens

Sansevieria
Scindapsus
Selaginella
Tradescantia fluminensis
Zebrina pendula

For north window

Aglaonema
Araucaria
Aspidistra
Begonia rex
Bromeliads
Chlorophytum
Dieffenbachia
Ferns
Hedera

Impatiens sultanii
Monstera deliciosa
Peperomia
Philodendron scandens
Sansevieria
Scindapsus
Selaginella
Tradescantia fluminensis
Zebrina pendula

For south window

Acalypha
Amaryllis
Beloperone guttata
Bromeliads
Cacti
Chrysanthemum
Cissus

Lantana sellowiana
Lilium longiflorum
Muscari (Grape hyacinth)
Narcissi and daffodils
Pelargonium (*Geranium*)
Poinsettia
Rose, Miniature

Coleus
Euphorbia milii
Haemanthus
Hyacinthus

For east or west window

Anthurium
Araucaria
Begonia
Beloperone guttata
 Bromeliads
Caladium
Cissus
Dieffenbachia
Dracaena
Eucharis
 Ferns
Ficus spp.

Trailing or hanging plants

Asparagus sprengeri
Begonia pendula

Climbing or trellis plants

Cissus
Ficus pumila
Hedera

Tough evergreen plants

Aspidistra
Chamaerops humilis
Chlorophytum
Chrysalidocarpus lutescens
Cyperus alternifolius
Dieffenbachia
Dracaena
Ficus elastica
Ficus lyrata

For terrarium, bowl and bottle-gardens

Aglaonema commutatum
Asparagus plumosus var. *nanus*
Begonia rex
Billbergia nutans

Succulents
 Tulips
Zantedeschia
Zephyranthes

Fuchsia
Grevillea robusta
Gloxinia
Hedera
Impatiens sultanii
 Palms
Pandanus
Rhododendron (*Azalea*)
Tradescantia fluminensis
Zantedeschia
Zebrina pendula
Zygocactus truncatus

Tradescantia fluminensis
Zebrina pendula

Hoya carnososa
Philodendron scandens
Scindapsus

Howea spp.
Licula spp.
Monstera deliciosa
Pandanus
Philodendron spp.
Phoenix spp.
Sansevieria
Scindapsus

Ficus pumila
Fittonia verschaffeltii
Maranta leuconeura var.
kerchoveana

Calathea illustris
Cryptanthus bivittatus roseo-pictus
Dracaena godseffiana
Dracaena sanderiana
 Ferns (*Adiantum cuneatum*,
Asplenium nidus, *Davallia bullata*,
Nephrolepis, *Pteris cretica*)

Peperomia obtusifolia
Peperomia magnoliaefolia
Philodendron scandens
Pilea microphylla syn. *P.*
muscosa
Saintpaulia ionantha
Scindapsus pictus var. *argyraeus*
Selaginella
Tradescantia fluminensis
Zebrina pendula

For dish or trough gradens

Aglaonema commutatum
Araucaria
Asparagus plumosus var.
nanus
Begonia rex
Begonia semperflorens
 Cacti
Calathea
Chlorophytum
Coleus
Dieffenbachia
Dracaena godseffiana
Dracaena sanderiana

Hedera
Peperomia obtusifolia
Philodendron scandens
Maranta

Pilea
 Pine seedlings
Saintpaulia ionantha
Sansevieria
Scindapsus
Selaginella
Syngonium podophyllum
Tradescantia fluminensis
Zebrina pendula

